936,314.

H. G. DITTBENNER.

BAND SAW MILL.

APPLICATION FILED JULY 14, 1906.

Patented Oct. 12, 1909.

7 SHEETS—SHEET 1.

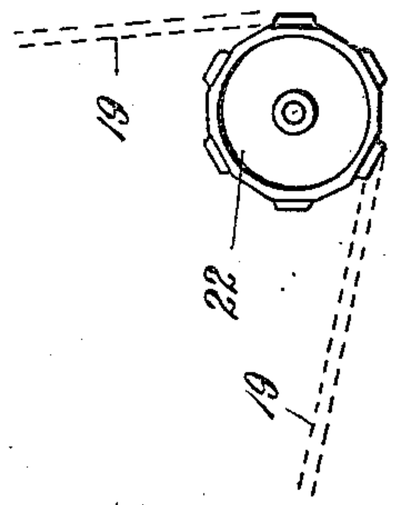

Fig. 1.

Witnesses.

E. W. Jeppesen.

R. H. Ophahl.

Inventor.

Hermann G. Dittbenner.

By his Attorneys.

Williamson & Merchant

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7 SHEETS—SHEET 2.

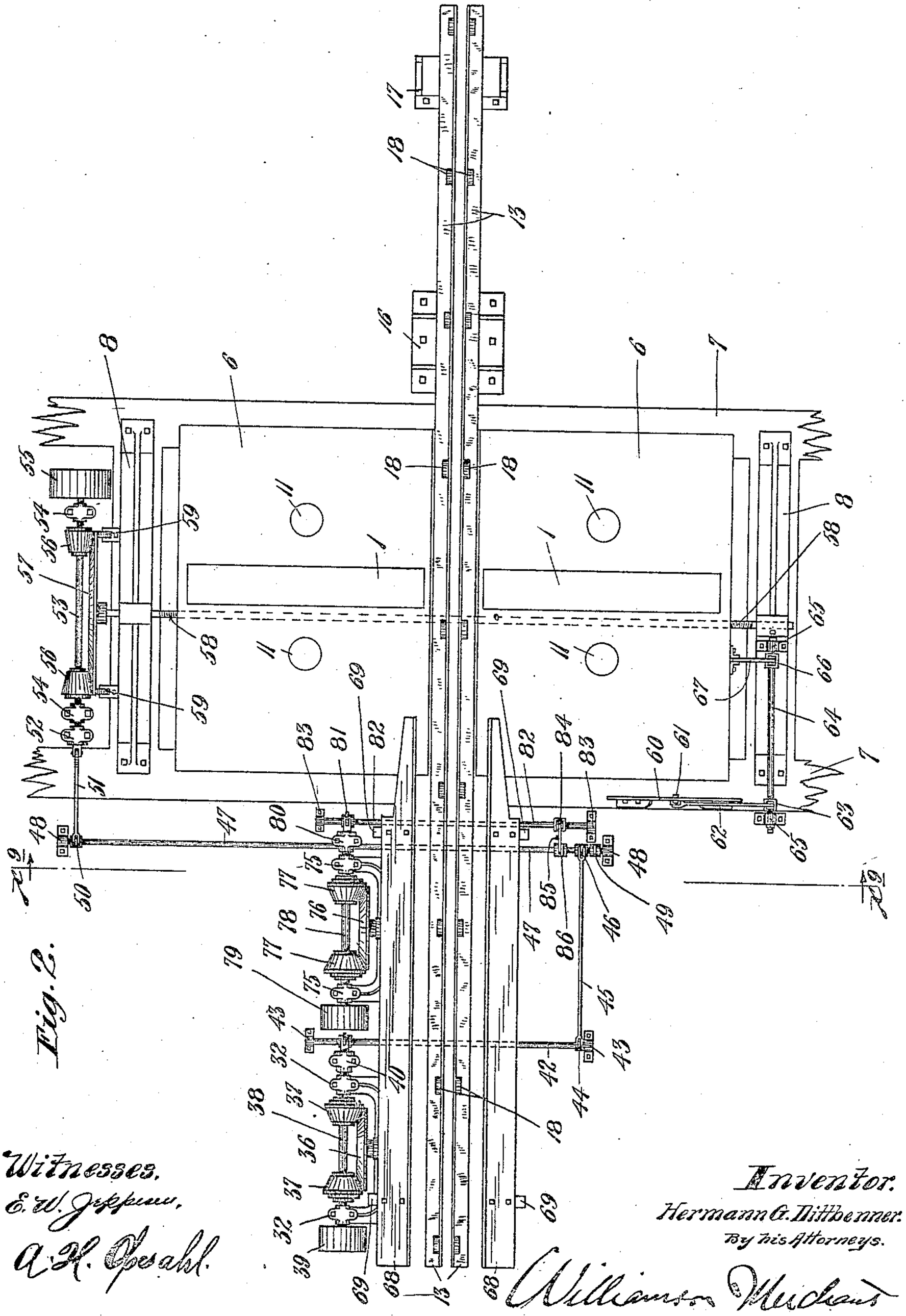

Fig. 2.

Witnesses.
E. W. Jeffers.
A. H. Osgood.

Inventor.
Hermann G. Dittbenner.
By his Attorneys.
Williamson Merchant

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7 SHEETS—SHEET 3.

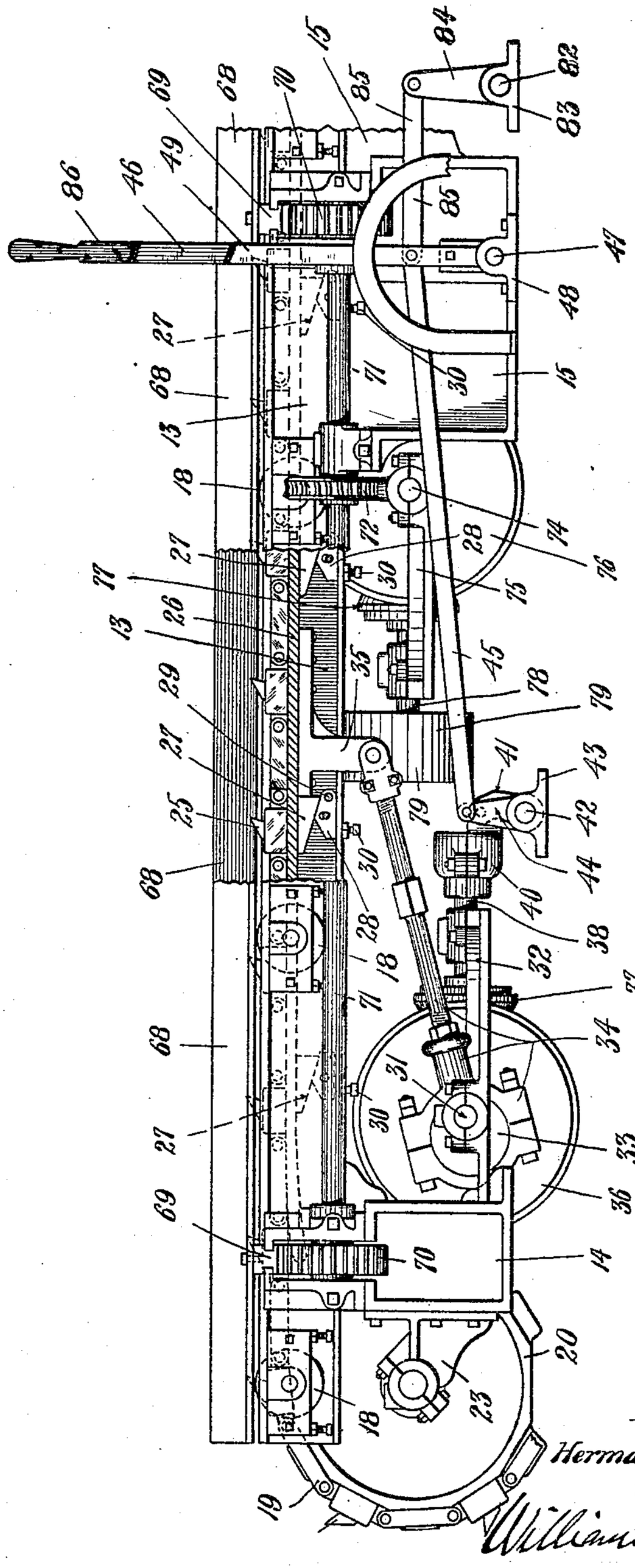

Fig. 3.

Witnesses

E. W. Jeffers.

A. H. Spoehl.

Inventor:

Hermann G. Dittbenner.

By his Attorneys.

Williamson & Merchant

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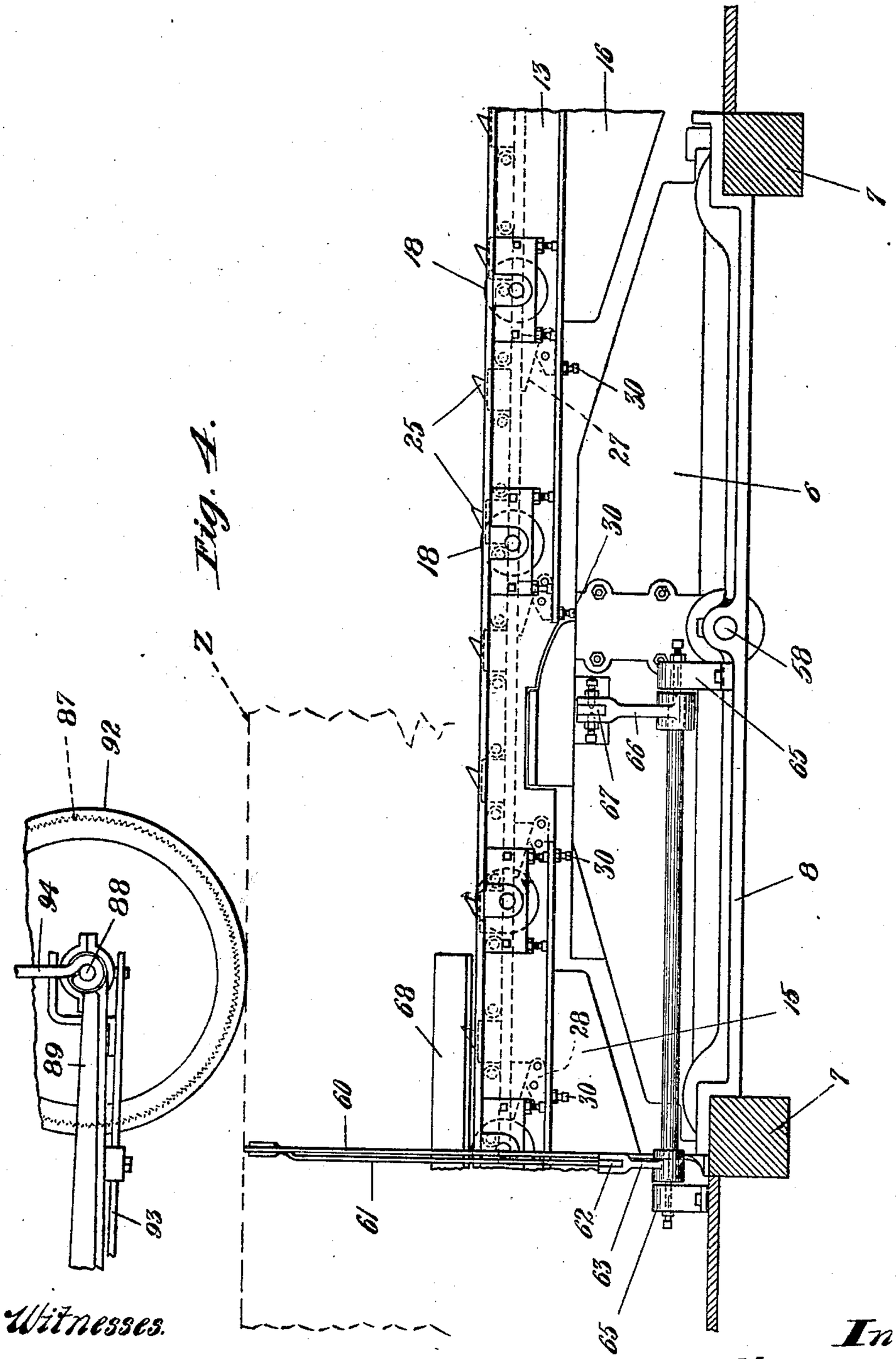
7 SHEETS—SHEET 4.

Fig. 4.



Witnesses.

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A. H. Ofoahl.

Inventor:

Hermann G. Dittbenner:

By his Attorneys.

Williamson & Merchant

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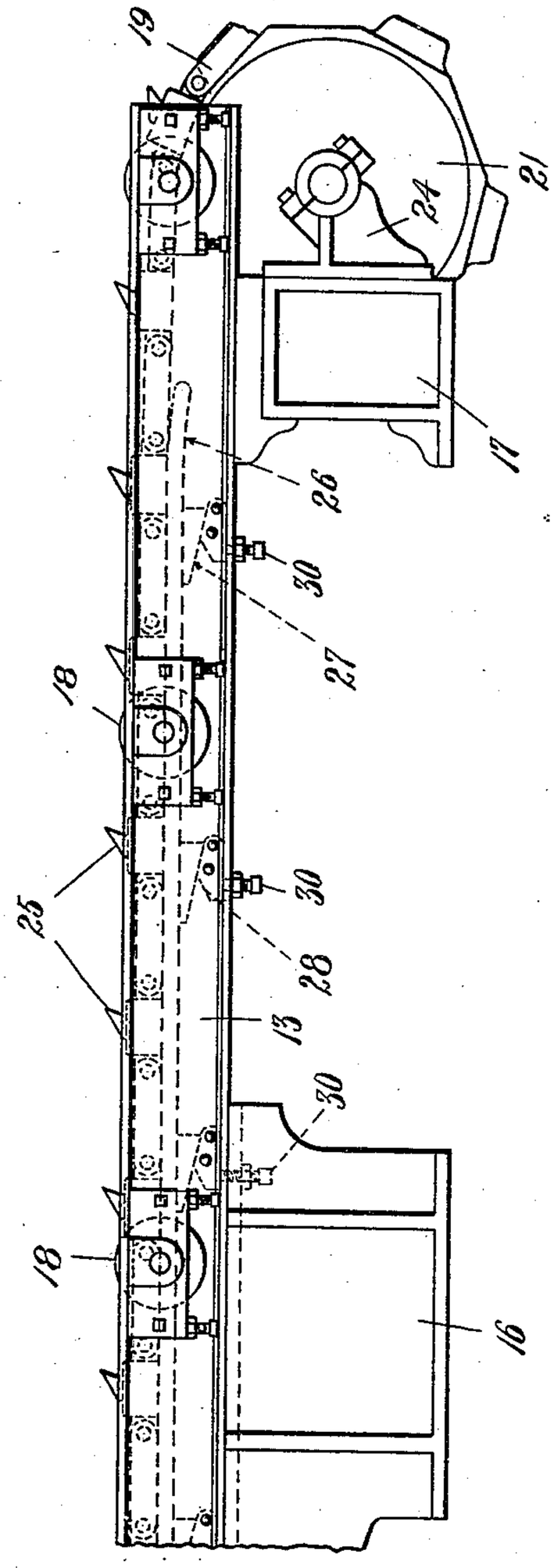
7 SHEETS—SHEET 5.

Fig. 5.



Witnesses.

E. W. Jeffers.

A. H. Opsahl.

Inventor.

Hermann G. Dittbenner.

By his Attorneys.

Williamson & Merchant

ANDREW. B. GRAHAM CO., PHOTO-LITHOGRAPHERS, WASHINGTON, D. C.

H. G. DITTBENNER.

BAND SAW MILL.

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7 SHEETS—SHEET 6.

Fig. 6.

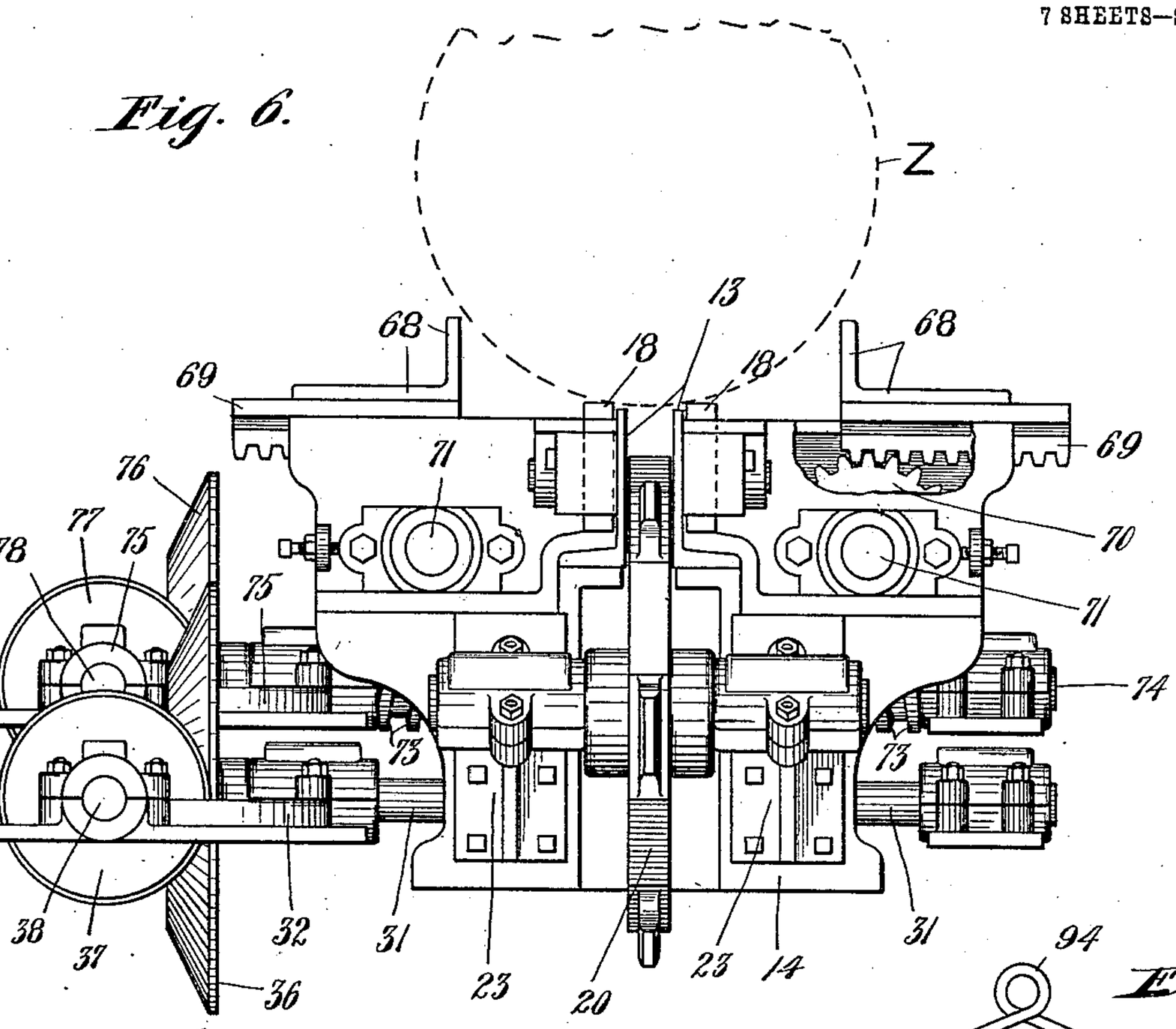


Fig. 7.

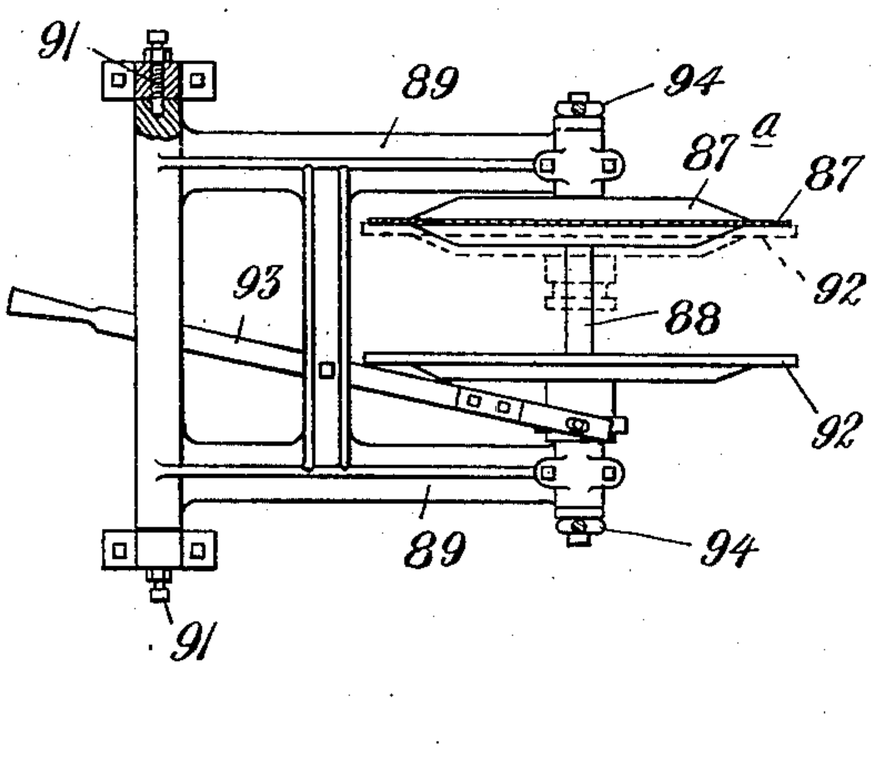
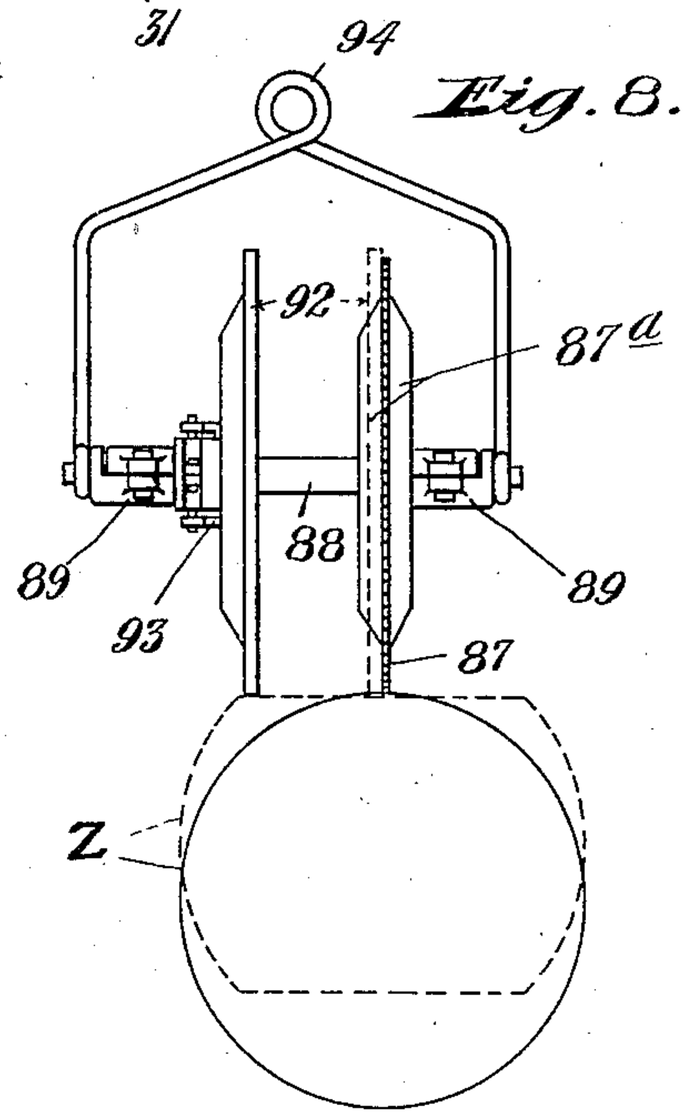


Fig. 8.



Witnesses.

E. W. Jeffress.

A. H. Ogsahl.

Inventor:

Hermann G. Dittbenner.

By his Attorneys.

Williamson & Cushman

H. G. DITTBENNER.

BAND SAW MILL.

APPLICATION FILED JULY 14, 1906.

936,314. Patented Oct. 12, 1909.

7 SHEETS—SHEET 7.

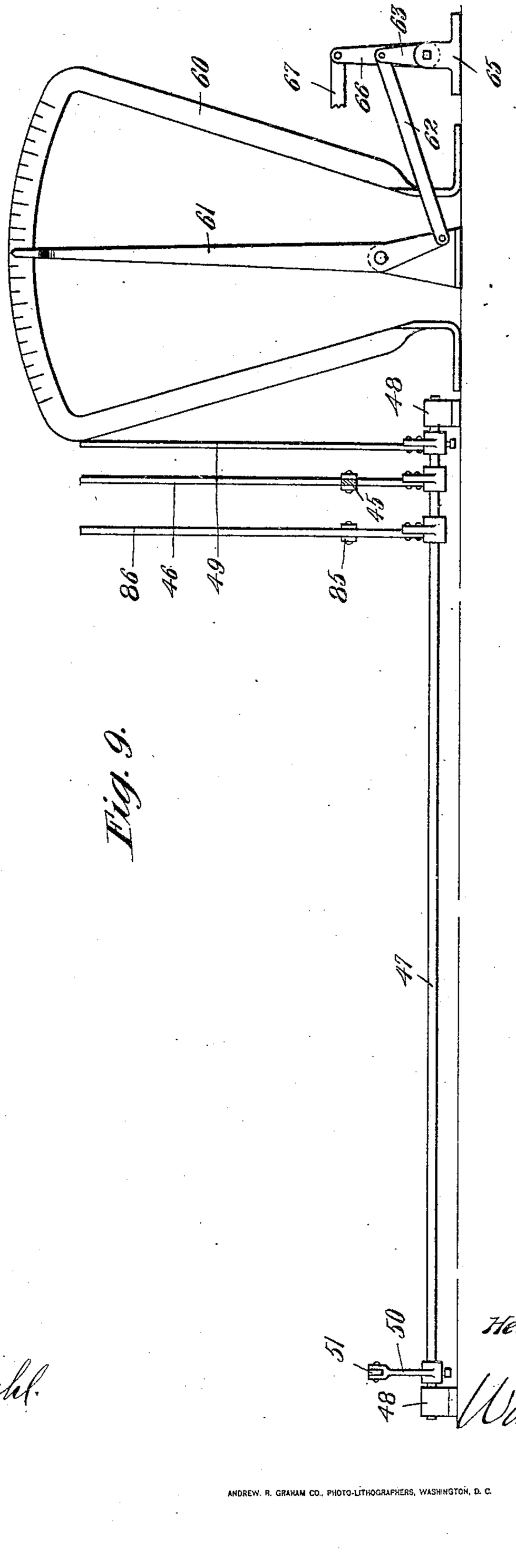


Fig. 9.

Witnesses.

E. W. Jeppesen.

A. H. Opsahl.

Inventor.

Hermann G. Dittbenner.

By his Attorneys.

Williamson & Cleveland

ANDREW. B. GRAHAM CO., PHOTO-LITHOGRAPHERS, WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

HERMANN G. DITTBENNER, OF MINNEAPOLIS, MINNESOTA.

BAND-SAW MILL.

936,314. Specification of Letters Patent. Patented Oct. 12, 1909.

Application filed July 14, 1906. Serial No. 326,249.

To all whom it may concern:

Be it known that I, HERMANN G. DITTBENNER, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Band-Saw Mills; 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.

My present invention relates to band saw mills, and especially to those employing twin band saws arranged to simultaneously saw from two sides of a log, and is particularly directed to improved means for feeding the logs to the twin band saws.

To the above ends the invention consists of the novel devices and combinations of devices hereinafter described and defined in the claims.

The invention is illustrated in the accompanying drawings, wherein like characters indicate like parts throughout the several views.

Referring to the drawings, Figure 1 is a view in side elevation, showing a twin band saw mill having the several features of my invention incorporated therein or applied thereto. Fig. 2 is a plan view of the mill, some parts being shown in diagram only, some parts being broken away and some parts being removed. Figs. 3, 4 and 5 are supplemental views in side elevation corresponding to Fig. 1, but showing the parts on a larger scale; the said Fig. 3 showing that part of the machine which is at the left of the line marked x^3 x^3 on Fig. 1, Fig. 4 showing that part of the machine which is between the lines marked x^3 x^3 and x^4 x^4 on said Fig. 1; and Fig. 5 showing that part of the machine which is at the right of the line marked x^4 x^4 on said Fig. 1. Fig. 6 is a front end elevation of the machine, some parts, such as the saws, being removed, and some parts being broken away. Fig. 7 is a plan view of an overhead feed device, Fig. 8 is a rear elevation of the overhead feed device shown in Fig. 7, illustrating the action thereof on a log; and Fig. 9 is a transverse section taken on the line x^9 x^9 of Fig. 2, some parts being removed.

The parts of the twin band saw mill proper, in so far as it is desirable for the purposes of this case to note, are as follows:

The twin band saws 1 are mounted to run over upper guide wheels 2 and over lower guide wheels 3. The lower guide wheels 3 are carried by shafts 4 that are journaled in depending bearings 5 of independent bed plates 6, which bed plates are mounted to move toward and from each other transversely of the machine, and are supported and guided on transversely extended beams or supports 7. The said beams or base supports 7, outward of the adjustable bed plates 6, are rigidly connected by tie bars 8, best shown in Figs. 1, 2 and 4. On the lower saw shafts 4 are pulleys 9 over which power driven belts (not shown) are adapted to run to impart motion to the saws. The shafts of the upper saw guide wheels 2 are journaled in bearings 10 that are vertically adjustable on pedestals 11, which pedestals are supported in pairs by the adjustable base plates 6. The bearings 10 are yieldingly pressed upward, and the saws 1 are put under tension, by the usual saw tension devices which form no part of the present invention and which are therefore designated as entireties by the numeral 12, inasmuch as they require no further consideration.

The logs delivered to the twin saws are supported upon and guided between the saws by a pair of long parallel guide rails 13 that extend between said saws and are rigidly connected and supported by supplemental bed frame sections 14, 15, 16 and 17. The so-called "guide rails" 13 are, as shown, flanged at their lower edges, and to their vertical flanges are journaled, at suitable intervals, small wheels or rolls 18 upon which the log z will directly rest and over which the said log will directly travel under but slight friction. The logs are fed from the left toward the right with respect to Figs. 1 to 5 inclusive, by an endless sprocket and chain drive, involving a heavy link chain 19 and coöperating sprocket wheels 20, 21 and 22. As shown, the sprocket 20 is journaled on suitable brackets 23 secured to the bed frame section 14, while the sprocket 21 is journaled to similar bearing brackets 24 on the bed frame section 17. The sprocket 22 which, as illustrated, is a driving sprocket and is positively driven by suitable connections (not shown), is journaled in suitable bearings not shown in the drawings.

The feed chain 19 is provided with projecting barbs or teeth 25, shown as applied to alternate links thereof. The upper horizontally extended portions of the said feed

chain 19 runs over a horizontally disposed supporting deck or guide strip 26 that is located between the guide rails 13, below the upper surfaces of the track wheels or rolls 18. At suitable intervals of distance along the bottom of the guide deck 26 are depending cam blocks 27 that directly engage with underlying cam blocks 28. The cam blocks 28, as shown, are pivotally connected at 29 (see particularly Fig. 3) to the vertical webs of the guide rails 13 and they are adapted to be adjusted vertically by set screws 30 that work through flanges of the said rails 13. The coöperating cam blocks 27 and 28 act under longitudinal adjustments to raise and lower the chain guiding deck 26, so as to cause the barbs 25 to project more or less above or below the horizontal plane of the upper portions of the track wheels 18. The purpose of such adjustment is to cause the said barbs to engage, to a greater or less extent, with the bottom of the log which is being fed to the saws by the feed chain. When an unsawed log or a log having its bottom uncut, rests upon the track wheels 18, it is desirable that the chain barbs 25 engage the log to the greatest possible extent; but after slabs have been cut from the log, and one of the flat surfaces thereof rests upon the said track wheels, it is desirable that the chain barbs engage only to a very slight extent with the flat bottom face of the log.

A hand controlled power device is provided for moving the chain supporting deck 26 endwise to effect the above noted vertical adjustments thereof. This device, as shown, comprises a shaft 31 which is mounted in a bearing bracket 32 and secured to the floor or other suitable support. The shaft 31 carries an eccentric 33 that is connected by an eccentric strap and rod 34 to an arm 35 that is secured and depends from the bottom of the intermediate portion of the chain supporting deck 26, as best shown in Fig. 3. At one end, the eccentric shaft 31 carries a beveled friction wheel 36, with which coöperates a pair of reversely beveled friction pinions 37 that are secured to the shaft 38, which shaft is mounted to rotate and for limited sliding movements in suitable bearings afforded by portions of the bearing bracket 32. Rotary motion is imparted to the shaft 38 by a power driven belt (not shown) which runs over a pulley 39 secured to one end of the shaft 38. The other end of said shaft 38 is swiveled to a coupling head 40 (see Fig. 2) that is connected by a short link 41 (see Fig. 3) of a rock shaft 42 mounted in suitable fixed bearings 43. At the operator's side of the machine, the rock shaft 42 is provided with a second arm 44 which is connected by a long link 45 to a lever 46, which lever, as shown, is loosely mounted on a long transversely extended rock shaft 47 mounted in suitable fixed bearings 48. By means of the lever 46, the friction pinions 37 may be alternately thrown into action on the friction wheel 36, at will, so as to thereby cause the shaft 31 and eccentric 33 to be rotated in either direction, to thereby produce endwise movements of the chain supporting deck 26, as required to effect the desired adjustments of the upwardly extended chain barbs 25.

At the operator's side of the machine, the long rock shaft 47 is provided with an operating lever 49, and near its other end it is provided with a short arm 50 that is connected by a link 51 to a coupling head 52. The coupling head 52 is swiveled to one end of a shaft 53 that is mounted for rotary and limited sliding movements in fixed bearings 54, and is provided at its other end with a pulley 55 over which runs a power driven belt (not shown) to impart rotary motion to said shaft. The said shaft 53 is provided with a pair of reversely beveled friction pinions 56 that coöperate with a friction wheel 57 secured to one end of a long screw rod 58. This screw rod 58 is journaled in the bearing brackets 8 before described, and is held against endwise movements and is provided with right and left threads that engage the respective transverse adjustable base plates 6, so that under rotary movements of said screw rod in one direction, the said base plates 6 and the respective saws carried thereby, will be moved toward each other, and under reverse movements of said screw rod, will be moved away from each other or farther apart. By means of the operating lever 49 the friction pinions 56 may be thrown into action in alternate order, on the friction wheel 57, to thereby rotate the screw rod 58 in either direction, at will. As shown, small bearing wheels 59 mounted on the adjacent fixed bearing bracket 8, engage the back of the friction wheel 57 and resist lateral thrusts put upon the said wheel by the said friction pinions 56.

On the fixed frame work 7 is a graduated segmental indicator plate 60 with which coöperates a pivoted pointer 61. The pointer 61 is connected, by a link 62, to an arm 63 of a rock shaft 64, which rock shaft is mounted in suitable fixed bearings 65 and is provided with arm 66 that is connected, by a link 67, to the adjacent bed plate 6. The graduations of the indicator plate 60 and the arrangement of the parts just described is such that the pointer 61 and coöperating indicator plate 60 will indicate the distance between the cutting or vertical adjacent portions of the two band saws 1. This indicating device, therefore, serves to indicate to the operator when the two saws are properly set, under the manipulation of the lever 49 and the frictional driving gears 56 and 57 and coöperating parts.

When the logs are delivered onto the re-

ceiving ends of the rails 13, or onto the receiving members of the rollers 18 thereof, they will usually lie somewhat obliquely to the said rails or, in other words, to the direction in which the log is to be fed to the saws. Hence, I provide a pair of laterally spaced and laterally adjustable alining devices which are preferably in the form of so-called "arighting bars" 68. These alining bars 68 have vertically and horizontally projecting flanges, and their horizontally extended flanges are rigidly secured to pairs of short racks 69 that are mounted to slide transversely of the machine on suitable run-ways or guides afforded by the bed plate sections 14 and 15. The racks 69 that are on the same side of the machine, mesh with spur gears 70 that are carried by a longitudinally extended counter-shaft 71 mounted in suitable bearings on said bed plate sections 14 and 15. Each of the counter-shafts 71 has a worm gear 72 (see Fig. 3) that mesh with worms or screws 73 carried by a transverse counter-shaft 74 mounted in suitable bearings afforded by a rigidly secured bearing bracket 75. One of the worms 73 (see particularly Fig. 6) has right hand threads, and the other has left hand threads, and the cooperating worm gears 72, of course, are correspondingly threaded. At one end, the worm shaft 74 is provided with a beveled friction gear 76 that is adapted to be engaged alternately by a pair of reversely beveled friction pinions 77 on a shaft 78 mounted in suitable bearings afforded by the bracket 75. The said shaft 78 is capable of endwise movements to effect the alternate engagement of its friction pinions 77 with the friction wheels 76. At one end, said shaft 78 carries a pulley 79 over which a power driven belt (not shown) runs to impart rotary motion to said shaft. At its other end, said shaft 78 is swiveled to a coupling head 80 that is connected by the short arm 81 of a transversely extended rock shaft 82 that is mounted in fixed bearings 83. At the operator's side of the machine, the rock shaft 82 has an arm 84 that is connected by a short link 85 to an operating lever 86 which, as shown, is loosely pivoted on the heretofore noted rock shaft 47. The three operating levers 46, 49 and 86 are, as will be seen, located close together where they may be easily controlled by a single operator. As is evident, by the manipulation of the lever 86, the friction pinions 77 may be thrown into engagement with the friction wheel 76, alternately and at will, so as to thereby rotate the worm shaft 74 in either direction, and thereby imparting to the two alining bars 68 parallel movements either toward or away from each other. When the two alining bars 68 are pressed against the log which lies out of line with the direction of feed, or obliquely to the rails 13, and the two alining bars are then forced closer together, the log will be turned parallel with the said rails and to the line of feed and will be centered with respect to the space between the cutting portions of the two saws. The said alining bars should not, of course, be pressed against the log with sufficient force to raise the same from the underlying track wheels 18. These laterally adjustable alining bars or devices greatly facilitate the operation of saw mills of this general character, and I believe the same to be broadly new.

I further provide an improved overhead feeding device which not only assists in holding the log properly seated on the track wheels, but serves also to prevent canting or other movement of the log out of the proper line of true feed movement to the saws. This device is best shown in Figs. 1, 4, 7 and 8, wherein the numeral 87 indicates a serrated or saw-toothed guide wheel or disk that is secured to a spindle 88 mounted in bearings formed by the free portion of a floating frame 89, which frame, as shown, is pivotally connected to an overhead support 90, by means of trunnion pointed set screws 91. To strengthen the toothed guide wheel 87 laterally, it is formed with a thickened body 87^a that terminates considerably inward of its toothed periphery. Mounted to slide and to rotate on the spindle 88 is a smooth-rimmed presser wheel 92 that is adapted to be moved laterally by a shipper lever 93 pivoted to the floating frame 89. The diameter of this presser wheel 92 is, at least, equal to or greater than the extreme diameter of the toothed guide wheel 87, measured from the extreme points of its teeth. This presser wheel 92 is so constructed that it may be moved flat-wise with its smooth-rimmed portion in close engagement with the toothed portion of the guide wheel 87, and when so moved will throw the teeth of the said wheel 87 entirely out of action. When an uncut log or a log having its bottom and top portions uncut, is being fed to the saws over the track wheels 18, the smooth wheel 92 should be moved to one side, as shown in Fig. 8, and the toothed guide wheel should then be engaged with the rough upper portion of the log. This toothed guide wheel will prevent the log from rolling or canting and will cause the same to travel in a straight line to the same. After the two sides of the log have been slabbed or cut flat, and one of these flat sides is turned down upon the track wheels 18, and the other flat side thereof turned upward, there will be no tendency for a log to roll or cant, and, furthermore, it is not desirable that the cut surface of the log be punctured by the teeth of the said guide wheel 87. Hence, the smooth-rimmed presser wheel 92 is then moved up against

the said toothed wheel 87 and the latter is then held out of action.

As shown, a bail 94 is attached to the free portion of the floating frame 87 and is provided with a lifting rope 95 which may run over a suitable over-head support or guide. This lifting connection, which may be of any suitable construction, serves to lift and hold the over-head guide device out of action when one log is being removed and one is being placed in position to be sawed.

What I claim is:

1. In a machine of the kind described, the combination with a saw, of means for supporting the logs and feeding the same to the saw, said feeding means including an endless conveyer having log-engaging barbs, and means for setting said barbs in different vertical adjustments in respect to the log-supporting means, and to vary the extent of engagement of said barbs with the log at the saw and at the front and rear thereof, substantially as described.

2. In a machine of the kind described, the combination with a saw, of means for supporting the logs and feeding the same to the saw, including suitable guides, an endless chain having log-engaging barbs, and means for vertically adjusting the operative portion of said chain in respect to said guides, and to vary the extent of engagement of the said barbs with the log at the saw and at the front and rear thereof, substantially as described.

3. In a machine of the kind described, the combination with a saw, of means for supporting the logs and feeding the same to the saw, said feeding means including an endless chain having barbs for engagement with the logs, a chain supporting deck over which the operative portion of said chain runs, and means for vertically adjusting said deck in respect to said log supporting means, to vary the extent of engagement of said barbs with the logs at the saw and at the front and rear thereof, substantially as described.

4. In a machine of the kind described, the combination with a saw, of means for supporting the logs and feeding the same to the saw, said feeding means comprising an endless feed chain and coöperating sprocket wheels, and the said chains having barbs for engagement with the logs, a chain supporting deck over which the operative portion of said chain runs, relatively fixed cam blocks and coöperating cam blocks secured to said deck, which cam blocks support said deck in such manner that it will be moved vertically when it is moved endwise, and means for moving said deck endwise to vary the extent of engagement of the chain barbs with the logs at the saw and at the front and rear thereof, substantially as described.

5. In a machine of the kind described, the combination with a saw, of means for supporting the logs and for feeding the same to said saw, said feeding means including an endless conveyer having barbs for engagement with the logs, and a power-driven manually-controlled device for vertically adjusting the barbs of said conveyer in respect to said log supporting means, to thereby vary the extent of engagement of said barbs with the logs at the saw and at the front and rear thereof, substantially as described.

6. In a twin band saw mill, the combination with a pair of band saws and means for guiding and driving the same, of means for supporting the logs while they are being fed to the saws, an endless power-driven feed chain arranged to run transversely of and between said saws and provided with barbs for engagement with the logs, and means for adjusting the barbs of said chain in respect to the log supporting means, to vary the extent of engagement of the barbs with the logs at the saw and at the front and rear thereof, substantially as described.

7. In a machine of the kind described, the combination with a pair of band saws and means for guiding and driving the same, of a log-support extending between said saws and provided with a slot, an endless barb-equipped power-driven feed chain running in the slot of said support and between said saws, a pair of log-alining bars extending parallel with but located one on each side of said feed chain, and means for imparting parallel lateral adjustments to said alining bars toward and from the log, substantially as described.

8. In a vertical band-saw edging machine, the combination with upper and lower band-saw wheels and mandrels therefor, of a support having an upper stock-surface and a slot therein, a feeding-chain having an upper feeding strand in said slot with an upper feeding surface extending substantially parallel with the axial planes of said saw-wheel mandrels, pressure means above said chain for pressing stock to be fed upon said chain, and means for adjusting the height between the upper surface of said upper strand of said feeding-chain and the upper surface of said support.

9. In a vertical band saw mill, the combination with upper and lower saw wheels and a band saw running thereon, of a support having a slot therein, a feed chain, the upper portion of which is mounted to run in the said slot longitudinally thereof, pressure means above said slot, and means for varying the relative vertical adjustments of the upper portion of said feed chain and the upper surface of said support.

10. In a vertical band sawing machine, the combination with feeding-in and feeding-out rolls and saw wheel mandrels, of a support, said support having a slot, an end-

less chain having a strand running substantially parallel with said saw-wheel mandrels in said slot, and means for causing relative positioning up and down between said support and said strand.

11. In a vertical band saw edging machine, the combination with band saw wheels and mandrels therefor, of a support having an upper surface for the stock and a slot therein, a chain having an upper strand provided with an upper surface for the stock and a roll above said support constituting feeding means and driving means for said feeding means, said upper strand adapted to travel in said slot substantially parallel with the axial planes of said saw wheel mandrels, and means for changing the relative height between said upper surface of said upper strand and said upper surface of said support, substantially as described.

12. In a vertical band saw edging machine, the combination with upper and lower band saw wheels and mandrels therefor, of a support having an upper surface for the stock and a slot therein, a feeding chain having an upper strand traveling in said slot, means for supporting said upper strand, said supporting means and upper strand having guiding faces therebetween for guiding said upper strand substantially parallel with the longitudinal axes of said saw wheel mandrels, and means for adjusting the height between said upper strand and said upper surface of said support, substantially as described.

13. In a vertical band saw edging machine, the combination with upper and lower band saw wheels and mandrels therefor, of a support, said support having a groove, an endless feeding chain traveling in said groove substantially parallel to the axes of said saw wheel mandrels and forming a loop under said support, a feed roll above said feeding chain, a guiding support in said groove under the upper strand of said feeding chain, and means for raising and lowering said guiding support.

14. In a vertical band saw edging machine, the combination with upper and lower band saw wheels and mandrels therefor, of a support having a groove, an endless chain traveling in said groove substantially parallel to the axes of said saw wheel mandrels, a feeding roll above said feeding chain, a wedge piece in said groove under the upper strand of said chain, and means for permitting longitudinal adjustment of said wedge piece for raising or lowering said feeding chain.

15. In a vertical band saw edging machine, the combination with upper and lower band saw wheels and mandrels therefor, of a support, an endless feeding chain, said support having a groove provided with an inclined lower face, a wedge piece extending longitudinally of said groove, guiding faces between said wedge piece and feeding chain for causing said feeding chain to travel substantially parallel with the longitudinal axes of said saw wheel mandrels, said feeding chain and said support respectively having feeding faces, means for permitting adjustment of said wedge piece for adjusting the feeding face of said feeding chain to height relatively to the feeding face of said support, said feeding chain traveling closely adjacent to the band saw blade position in said support, substantially as described.

16. In a vertical band saw edging machine, the combination with upper and lower band saw wheels and mandrels therefor, of a support having an upper stock surface and a slot therein, a feeding chain having an upper feeding strand in said slot with an upper feeding surface extending substantially parallel with the axial planes of said saw wheel mandrels, pressure means above said chain for pressing stock to be fed upon said chain, and means for adjusting the height between the upper surface of said upper strand of said feeding chain and the upper surface of said support.

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

HERMANN G. DITTBENNER.

Witnesses:

H. D. KILGORE,

F. D. MERCHANT.