

W. T. BRIDGES.
DOUBLE ACTING SAWMILL.
APPLICATION FILED DEC. 21, 1909.

1,002,129.

Patented Aug. 29, 1911.

2 SHEETS-SHEET 1.

Fig. 2.

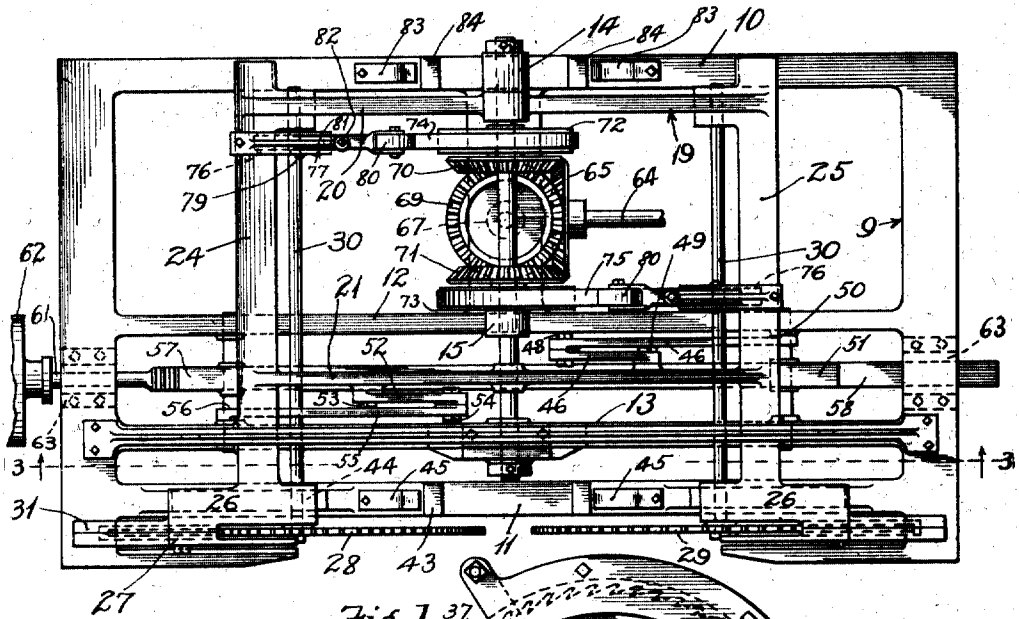
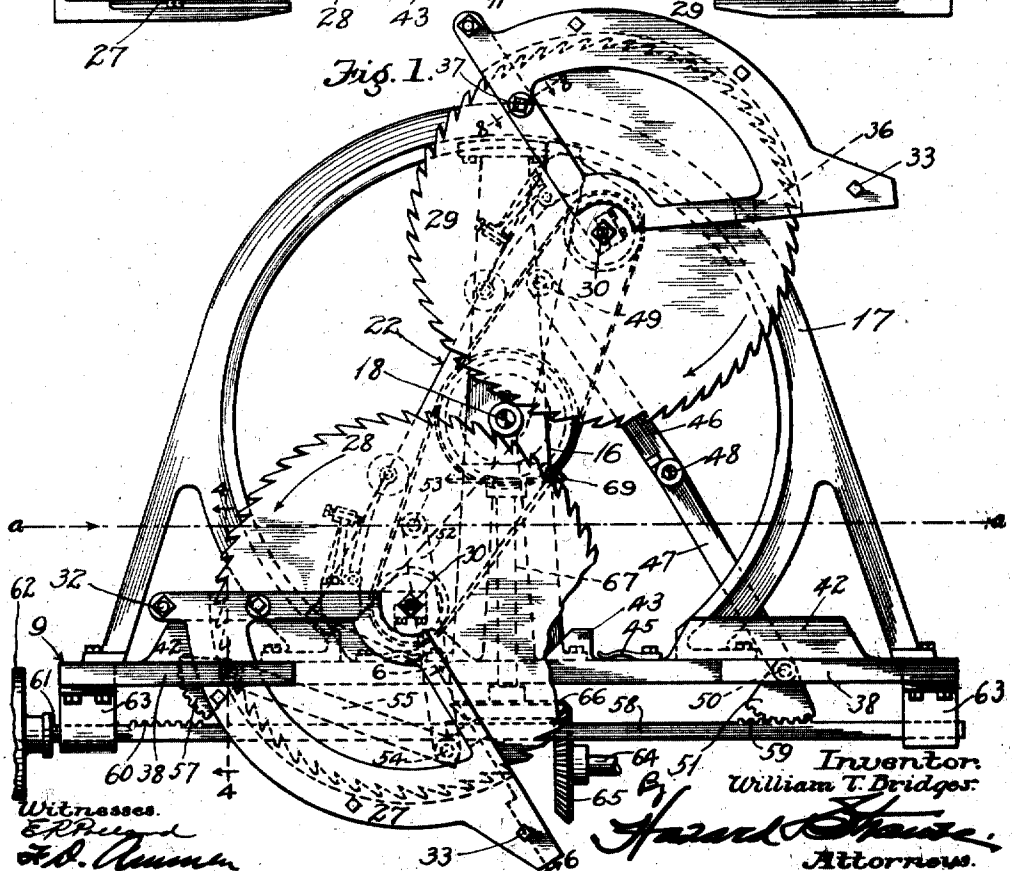


Fig. 1.



Witnesses.
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2 SHEETS—SHEET 2.

Fig. 3.

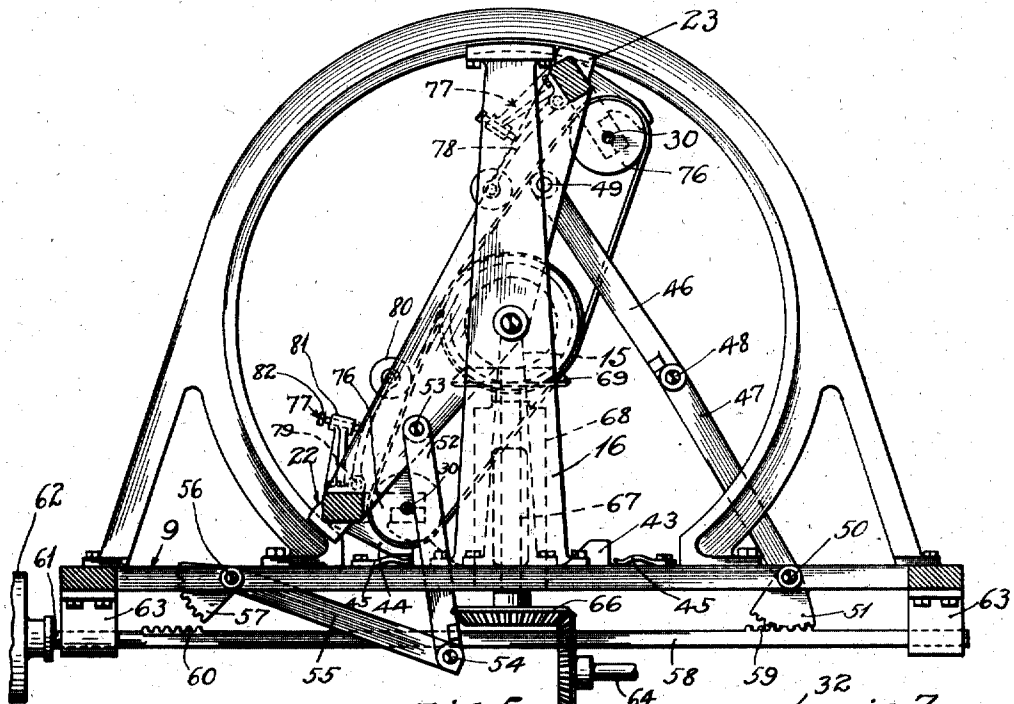


Fig. 5.

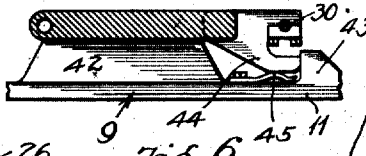


Fig. 6.

Fig. 4.

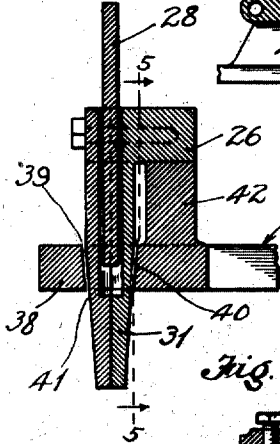


Fig. 8.

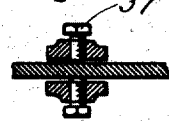
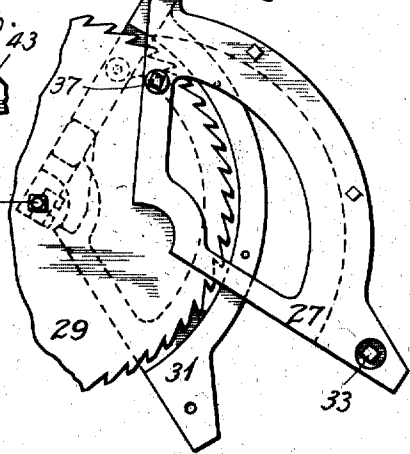


Fig. 7.



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UNITED STATES PATENT OFFICE.

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DOUBLE-ACTING SAWMILL.

1,002,129.

Specification of Letters Patent.

Patented Aug. 29, 1911.

Application filed December 21, 1909. Serial No. 534,316.

To all whom it may concern:

Be it known that I, WILLIAM T. BRIDGES, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles, State of California, have invented new and useful Improvements in Double-Acting Sawmills, of which the following is a specification.

This invention relates to saw mills, and the object of the invention is to produce a saw mill constructed in such a way as to enable it to operate upon a log or timber in both the directions of movement of the saw mill carriage.

More specifically, the saw mill comprises a pair of saws which are mounted upon a rocking frame. In one direction of movement of the carriage which supports the log or timber one of these saws is presented to the log, and in the other direction of the movement the other saw is presented to the log. With logs or timbers of unusually large dimensions both saws may operate upon the log simultaneously for the driving mechanism is such as to enable both saws to be continuously driven whatever be the position of the rocking frame.

The invention consists in the construction and combination of parts to be more fully described hereinafter and particularly set forth in the claims.

In the annexed drawing which fully illustrates my invention, Figure 1 is a front elevation of a saw mill constructed according to my invention certain parts being broken away. This view shows the rocking frame in one of its extreme positions so that the left hand saw is presented to the log. Fig. 2 is a plan of the saw mill but showing the rocking frame in its mid position, certain parts of the saw mill being broken away. Fig. 3 is a vertical section taken on the line 3-3 of Fig. 2 and further illustrating details of the construction. Fig. 4 is a vertical section taken on the line 4-4 of Fig. 1 and particularly illustrating the means for supporting and guiding the edges of the saw. This view is upon an enlarged scale. Fig. 5 is a vertical section taken on the line 5-5 of Fig. 4 further illustrating the means for supporting and guiding the saw blades, and also the means for taking the thrust which the log exerts on the same. Fig. 6 is a section taken on the line 6-6 of Fig. 1 and further illustrating the construction of the saw guards. Fig. 7 is a side elevation show-

ing a part of one of the saws and particularly illustrating the construction of the saw guards. This view is upon an enlarged scale. Fig. 8 is a section taken on the line 8-8 of Fig. 1 and also illustrating further the construction of the saw guards. This view is upon an enlarged scale.

Referring more particularly to the drawing, 9 represents the frame of the saw mill which is of substantially rectangular form in plan having a rear bar 10, a forward bar 11 and intermediate brace bars 12 and 13. On the bars 10 and 12 upright bearing posts 14 and 15 are mounted and on the bar 13 a bearing post 16 is mounted as indicated most clearly in Fig. 3. At this bearing post 16 a guide ring 17 is mounted, the lower portion of which is attached rigidly to the frame 9 as indicated. The upper portion is secured to the upper end of the post 16.

Rotatably mounted in the posts 14, 15 and 16 is provided a rock shaft 18 and on this rock shaft a rocking frame 19 is mounted. This rocking frame comprises a rear cross head 20 which is disposed adjacent to the bearing post 14, an intermediate cross head 21 adjacent to the bearing post 15 and a guiding cross head 22 having shoes 23 at the ends thereof which engage the inner edge of the guide ring 17. The rocking frame 19 is completed by two saw beams 24 and 25 which connect the cross heads 20, 21 and 22. These saw beams 24 and 25 extend parallel with the shaft 18 and in horizontal plane. The forward ends of the saw beams 24 and 25 are formed into heads 26 which are elongated transversely of the beams and these heads 26 are provided on their outer sides with saw guards 27 which extend around the edges of the saws 28 and 29. The saws 28 and 29 are of circular form and are rigidly attached to spindles 30 rotatably mounted in the heads 26 and in the rear ends of the beams 24 and 25 as shown. These saw guards 27 comprise removable plates of segmental form as indicated in Fig. 7, and similar guard plates 31 are provided on the inner sides of the saws which are rigidly attached to the heads 26. These guard plates 31 however, are not removable but simply form a guard for the inner sides of the saw blades 28 and 29. These guard plates 27 and 31 have arc shaped rims which envelop the rim of the saw so as to form a guard for the teeth of the saw for a part of the circumference of the saw as indicated. Each inner

guard plate 31 is provided with a pivot bolt 32, and the guard plate 27 may be swung outwardly on this pivot bolt to permit the saw to be removed.

- 5 Normally the guard plate 27 is rigidly held in position by means of a fastening bolt 33 which is carried by the guard plate 27 and is secured in the bolt opening 34 in the inner guard plate as indicated in Fig. 6.
- 10 As indicated also in Fig. 6 the adjacent faces of the guard plates 27 and 31 are cut away or formed with recesses 35 for the saw blade and at suitable points bosses 36 are formed which touch the side of the saw
- 15 and guide it, as will be readily understood. In addition to this, as indicated in Fig. 8 at another point I provide oppositely disposed set screws 37 which are mounted respectively in the guard plates 27 and 31 and the
- 20 points of these set screws touch the sides of the saw blade so as to guide the saw as will be readily understood.

- It should be seen that the rocking frame, when the saw mill is in operation, occupies
- 25 an inclined position as indicated in Fig. 1 with the left saw 28 depressed, or it may occupy an opposite position with the saw 29 depressed. When the rocking frame is in position as shown in Fig. 1, the upper portions of the guard plates 27 and 31 seat in a
- 30 saw bracket 38 which forms a socket 39 having tapered side faces 40. This socket 39 is formed by means of a longitudinal tongue 41 which projects inwardly toward the central axis of the device from the side. At
- 35 the point where the guard plates 27 and 31 are received in the socket 39, they present tapered side faces corresponding to the tapered side faces 40. In this way a tapered shoe 41 is formed which fits in the tapered
- 40 socket and rigidly holds the saw guard in position. When the rocking frame is in this position, the head 26 is resting upon a block or rest 42 which is mounted upon the
- 45 upper side of the forward cross bar 11 of the frame 9. In addition to this, on the upper side of this cross bar 11 a thrust block 43 is formed, and adjacent to the heads 26 the rocking frame is formed with a down-
- 50 wardly extending foot 44 which thrusts against the vertical face of this block 43 as indicated in Fig. 5. In this way I form a firm seat in the heads 26 and I also provide for absorbing the thrust force which is
- 55 exerted by the log upon the saw blade. These blocks 42 and 43 are duplicated on each side of the central axis of the saw mill as indicated, and beneath the foot 44 springs
- 60 45 are provided which absorb the shock of throwing the rocking frame from one extreme position to the other. In order to shift the rocking frame in the manner suggested, I provide toggle links 46 and 47
- 65 which are arranged at the right of the saw mill pivotally connected together by a pivot

pin 48. The links 46 are pivotally attached to the intermediate cross head 21 by pivot bolts 49. The lower end of the link 47 is attached by a pivot bolt 50 to the frame 9, and rigidly attached to the lower end of this link I provide a segment 51. On the opposite side of the central axis of the saw mill a similar construction is provided comprising a toggle link 52 pivotally attached at 53 to the cross head 21, and this link 52 is connected by a pivot bolt 54 with a toggle link 55. The lower end of the toggle link 55 is attached by a pivot bolt 56 to the frame 9 and it carries rigidly a segment 57 similar to the segment 51. Mounted to slide transversely of the central axis of the saw mill and on the under side of the frame 9 I provide a rack 58 having rack teeth 59 and 60 which are adapted to mesh respectively with the segments 51 and 57. This rack 58 is formed at its left end into a piston rod 61 which extends into a cylinder 62 which enables the rack to be shifted by compressed air, steam or similar means. The ends of this rack are suitably supported in guide brackets 63.

In order to enable the saws to be driven continuously in either of the extreme positions of the rocking frame 19 I provide a horizontal driving shaft 64 which is provided with a bevel gear wheel 65 meshing with a corresponding bevel gear wheel 66. This bevel gear wheel 66 is attached to the lower end of a vertical counter-shaft 67 which extends upwardly in a suitable guide 68. At its upper end the shaft 67 is provided with a bevel gear 69. This bevel gear meshes with a pair of bevel gears 70 and 71 mounted loosely on the shaft 18. Rigid with the bevel gear 70 I provide a belt pulley 72 and a similar belt pulley 73 is rigid with the bevel gear 71. From the belt pulleys 72 and 73 belts 74 and 75 extend respectively and these belts 74 and 75 run over belt pulleys 76 which are rigidly attached to the saw spindles 30 as will be readily understood. From this arrangement it will be seen that when the shaft 64 is rotated the saws will be driven in opposite directions. In connection with the belts 74 and 75 I provide belt tighteners 77. Each of these belt tighteners comprises an arm 78 pivoted at 79 and provided with a roller or wheel 80 resting on the outer or upper side of the belt. These belt tighteners are mounted on the beams 24 and 25 and each belt tightener comprises also a bracket 81 having a set screw or adjusting screw 82 which touches the outer side of the arm 78 and enables the arm to be adjusted toward the belt so as to take up the slack of the belt as will be readily understood.

As indicated in Fig. 2, on the rear bar 10 of the frame 9 I provide springs 83 which correspond to the springs 45 on the forward

bar 11 and these springs cushion the rear ends of the saw beams 24 and 25 when they come into their depressed position. Adjacent to these springs 83 thrust blocks 84 are provided similar to the thrust blocks 43 and these thrust blocks assist in taking the thrust of the saw as will be readily understood.

I shall now describe the mode of operation of the saw.

As indicated in Figs. 1 and 3, the saw mill is arranged to receive the log moving from the left to right as indicated by the arrow on the line *a-a* in Fig. 1. As the log approaches the saw it comes in contact with the upper edge of the depressed saw 28, and if the log is very large it will also engage the lower edge of the saw 29, both saws being in the same plane. In this connection attention is called to the fact that when the rocking frame is in an inclined position the lower edge of the upper saw will be below the level of the upper edge of the lower saw. When in this position the toggle links 52 and 55 are flexed or "broken" at their joint of pivot connection 54. The toggle links 46 and 47 on the other hand will be extended nearly in line with each other and with the pivot pin 48 slightly beyond the dead center line connecting the bolts 49 and 50. This locks the rocking frame in this position with respect to any forces acting directly upon the rocking frame. In this position of the rocking frame as soon as the segment 57 becomes disengaged from the teeth 60 of the rack 58, through the rotation of the shaft 64, both saws will be continuously driven in opposite directions as indicated by the arrows in Fig. 1. When the log has passed from the left to the right and is to be returned by movement in the opposite direction the rocking frame will be shifted to an opposite extreme position. This is accomplished through the medium of the shifting cylinder 62 which slides the rack 58 toward the right. This movement of the rack operates through the segment 51 to swing the toggle joint at 48 inwardly and depresses the right side of the rocking frame. After this movement has continued a short time the teeth 60 come into engagement with the segment 57 so that the segment 57 will operate to elevate the left side of the rocking frame through the operation of the toggle links 52 and 55. After this engagement takes place between the teeth 60 and the segment 57, the segment 51 becomes disengaged from the teeth 59 and they eventually assume the same relation toward each other as that illustrated between the segment 57 and the teeth 60. From this arrangement it will be seen that first one side of the rocking frame is depressed and then the other, and in both of the extreme positions the depressed saw beam is supported on its under

side by a block 42. Furthermore the rocking frame is locked against movement from the fact that the toggle links attached to its upper side are substantially in alinement. In this way the saw mill is made to cut on both strokes of the saw mill carriage which carries the log.

The guide 17 prevents any displacement or any longitudinal shifting of the shaft 18 in its bearings, and forms an efficient guide for the rocking frame. In this way I relieve the bearing posts 14, 15 and 16 of dangerous strains acting in a horizontal plane tending to twist the rocking frame on a vertical axis.

Special attention is called to the manner in which the saw beams 24 and 25 overhang at their forward ends beyond the plane of the guide rings 17. This produces a large clearance between the plane of the saw and the guide so as to permit timbers of large size to be cut.

Having described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. A double acting saw mill comprising a main frame, a rocking frame mounted to rock thereupon on an axis elevated above the path of the log, saws carried by said rocking frame, means for holding said rocking frame with either side thereof depressed to present one of said saws in the path of the log and the other of said saws elevated thereabove, a fixed thrust block below and disposed to one side of the axis of said rocking frame adapted to be engaged by the depressed side of said rocking frame to absorb the thrust of the log moving from the depressed end of said rocking frame in the direction of the said axis of said rocking frame, and a fixed thrust block on the other side of said axis depressed therebelow, adapted to be engaged by the depressed side of said rocking frame to absorb the thrust exerted by the log in moving in the opposite direction.

2. A double acting saw mill comprising a main frame having a horizontal frame bar extending substantially parallel to the path of the log, a rocking frame supported on said main frame with its axis elevated above the path of the log, said rocking frame having oppositely extending arms, saws carried respectively at the ends of said arms, means for holding said rocking frame with either of said arms depressed so as to present one of said saws to the path of the log while the other of said saws is held elevated above the path of the log, a spring mounted on said bar adapted to be engaged by the ends of said arm to cushion the downward swinging movement thereof, a thrust block mounted on said bar at the left side of the axis of said rocking frame and receiving the thrust of the log passing from said block toward said axis and a thrust block mounted

on said bar on the opposite side of said axis and receiving the thrust of said rocking frame when the log passes in the opposite direction.

5 3. A double acting saw mill comprising a main frame, a rocking frame mounted thereupon, saws carried by said rocking frame, means for holding said rocking frame with either side thereof depressed to present one or the other of said saws to the log, guards carried by said rocking frame in connection with said saws and fixed brackets forming sockets receiving said guards when said guards are in their depressed positions, said guards forming guides for the saw blades.

4. A double acting saw mill, comprising a main frame, a rocking frame mounted on said main frame, saws carried by said rocking frame, guards carried by said rocking frame adjacent to said saws and sockets fixed on said main frame and receiving said guards to secure said guards and said saws against lateral displacement, said guards being guides for said saws.

5. A double acting saw mill comprising a main frame, a rocking frame rotatably mounted thereupon, saws carried by said rocking frame, saw guards carried by said rocking frame adjacent to said saws and affording means for guiding the said saws, and fixed sockets forming seats for said guards.

6. A double acting saw mill comprising a main frame, a rocking frame rotatably mounted thereupon, saws carried by said rocking frame, saw guards carried by said rocking frame adjacent to said saws and affording means for guiding the said saws, fixed sockets forming seats for said guards, and self locking means for holding first one side of the rocking frame depressed and then the other side thereof depressed.

7. A double acting saw mill comprising a main frame, a rocking frame mounted thereupon, saws carried by said rocking frame, toggle links connected with opposite sides of said rocking frame and adapted to lock said frame when extended and means for actuating said toggle links to depress either side of said rocking frame.

8. A double acting saw mill comprising a main frame, a rocking frame mounted thereupon, saws carried thereby, a pair of toggle links attached on one side of said rocking frame, a second pair of toggle links attached on the other side of said rocking frame and means for actuating either pair of said toggle links and arranged so as to become disengaged from one pair of said

links to permit an extreme movement of that pair of links.

9. A double acting saw mill comprising a main frame, a rocking frame mounted thereupon, saws carried thereby, a pair of toggle links attached to one side of said rocking frame, a pair of toggle links attached to the opposite side of said rocking frame, segments in connection with said links respectively and adapted to actuate the same, a rack adapted to engage said segments for actuating said links to depress first one side of said rocking frame and then the other side thereof.

10. A double acting saw mill comprising a main frame, a rocking frame mounted thereupon, saws carried thereby, a pair of toggle links attached to one side of said rocking frame, a second pair of toggle links attached to the opposite side of said rocking frame, segments in connection with said links respectively for actuating the same, a rack mounted to slide adjacent to said segments and having two sets of teeth for operating said segments, said rack being arranged so that the set of teeth adjacent to the depressed side of said frame becomes disengaged from its segment to permit an extreme movement of the toggle links adjacent thereto.

11. A saw mill having a main frame, a saw frame movably mounted thereupon, a saw spindle rotatably mounted in said saw frame, a saw adapted to be attached to the end of said spindle, a saw guard rigid with said saw frame and having a removable guard plate on the outer side of said saw, a socket receiving said guards when depressed.

12. A saw mill having a main frame, a rocking frame mounted upon said main frame, a guide for said rocking frame disposed in a plane substantially at right angles to the axis of rotation of said rocking frame, said saw frame having parallel overhanging beams extending beyond said guide, spindles extending along said beams and having a plurality of bearings thereupon and saws carried by the ends of said spindles in a plane removed from said guide whereby a clearance space is formed for the log between the plane of the saws and said guide.

In witness that I claim the foregoing I have hereunto subscribed my name this 13th day of December, 1909.

WILLIAM T. BRIDGES.

Witnesses:

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EDMUND A. STRAUSE.