No. 877,392. PATENTED JAN. 21, 1908.

C. J. ZEITINGER.

DOUBLE CUTTING ROTARY SAWMILL.

APPLICATION FILED DEC. 4, 1905.

2 SHEETS—SHEET 1.

Fig. I.

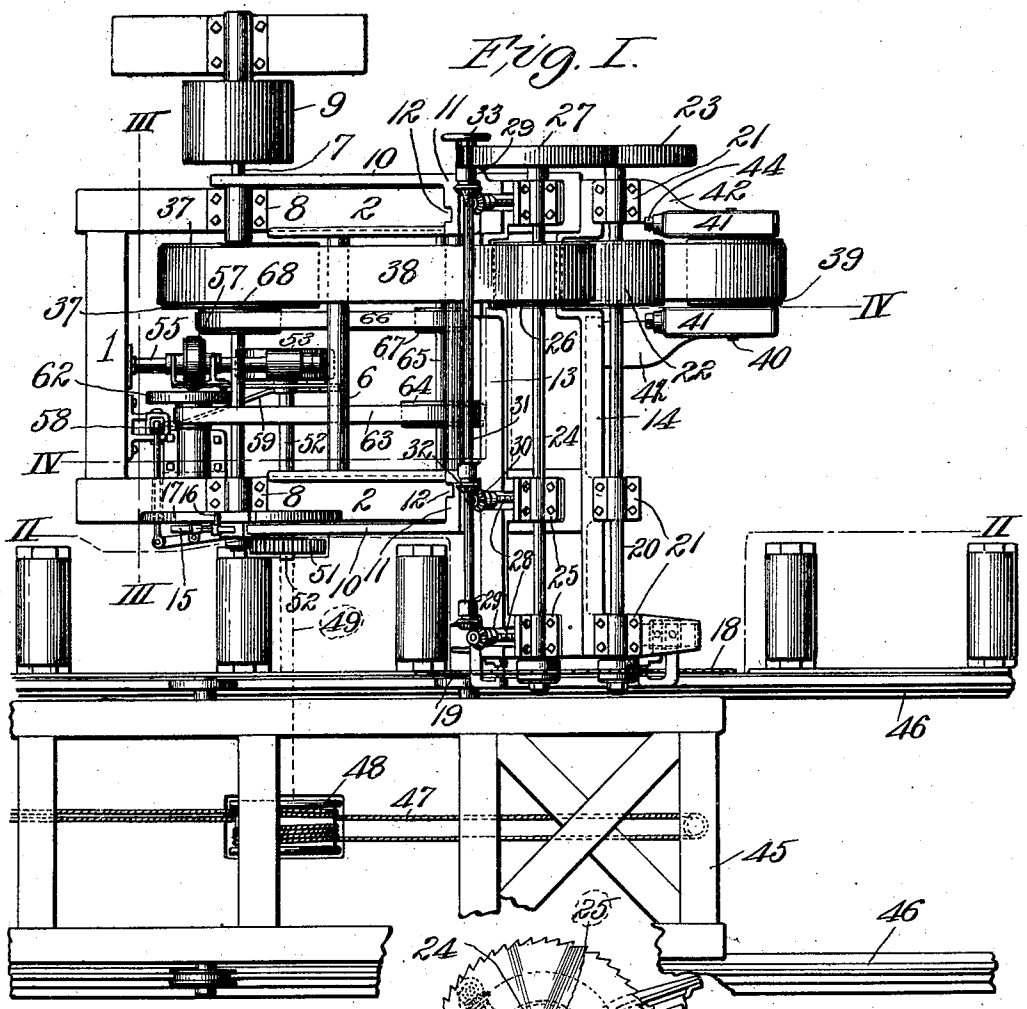
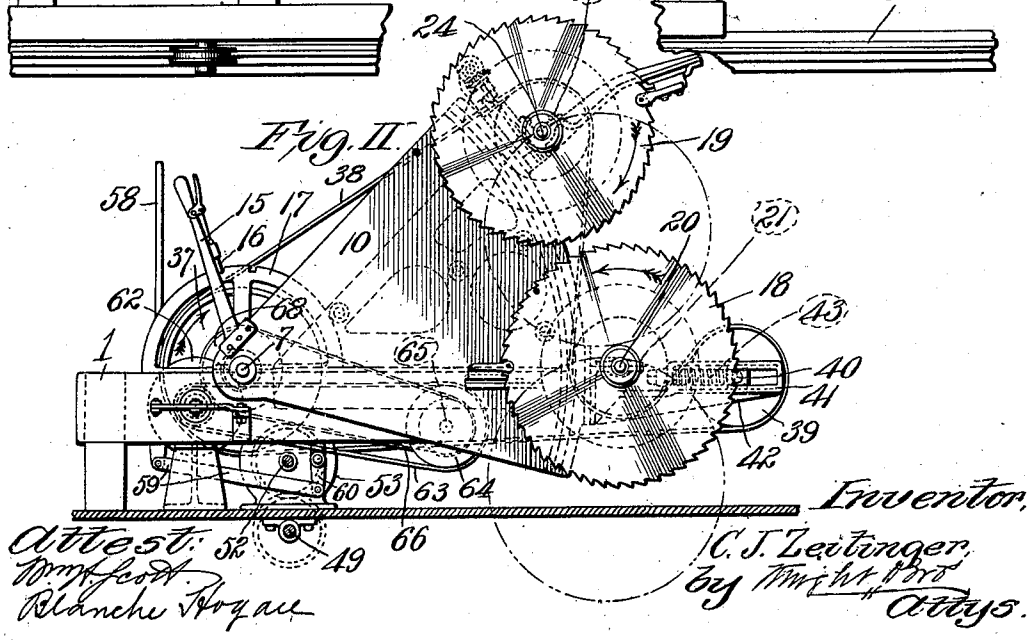


Fig. II.



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THE NORRIS PETERS CO., WASHINGTON, D. C.

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2 SHEETS—SHEET 2.

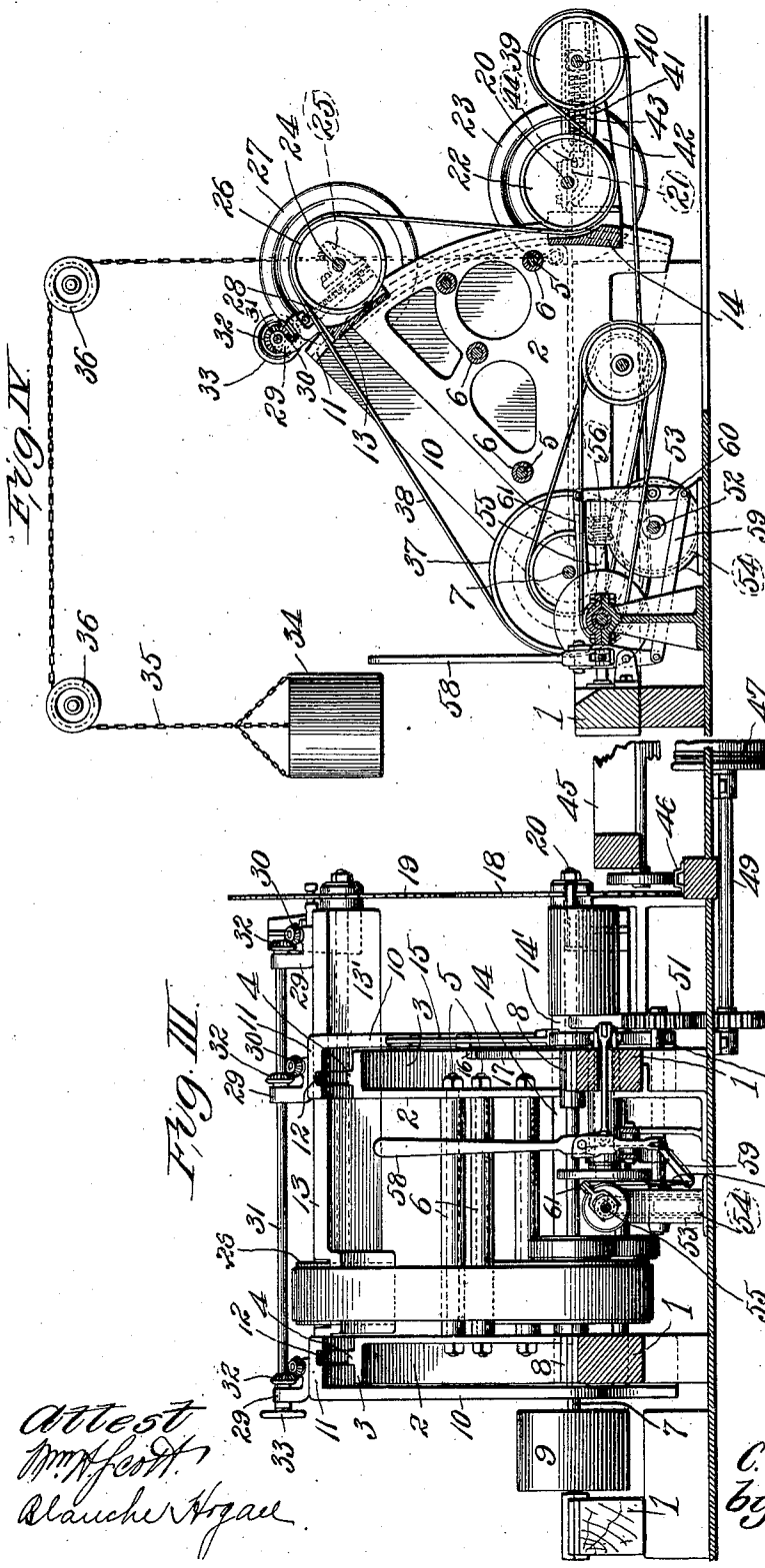


Fig. IV.

Fig. III.

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UNITED STATES PATENT OFFICE.

CHRISTIAN J. ZEITINGER, OF ST. LOUIS, MISSOURI.

DOUBLE-CUTTING ROTARY SAWMILL.

No. 877,392. Specification of Letters Patent. Patented Jan. 21, 1908.

Application filed December 4, 1905. Serial No. 290,072.

To all whom it may concern:

Be it known that I, CHRISTIAN J. ZEITINGER, a citizen of the United States, residing in the city of St. Louis, in the State of Missouri, have invented certain new and useful Improvements in Double-Cutting Rotary Sawmills, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to a sawmill containing two separately mounted circular saws and including means by which said saws are swingingly supported and means whereby the saws are driven in opposite directions for the purpose of causing one of the saws to cut on the forward stroke of the log carriage and the other saw to cut upon the backward stroke of said carriage, thereby providing for approximately a double cutting capacity in the mill.

The invention also relates to certain details of constructions in the mill as will hereinafter fully appear.

The object of my invention is to produce a double cutting rotary sawmill having the advantages of the double cutting band sawmill and a mill that may be operated by unskilled labor as distinguished from the operation of the double cutting band sawmill which must of necessity be operated by the most skilled labor.

Figure I is a top or plan view of my sawmill. Fig. II is a view partly in side elevation and partly in vertical longitudinal section taken on line II—II, Fig. I. Fig. III is a transverse section taken on line III—III, Fig. I. Fig. IV is a longitudinal section taken on line IV—IV, Fig. I.

1 designates the husk frame of my mill which may be of any well known construction.

2 are side frames mounted upon the sides of the husk frame and preferably of sector shape. Each of these side frames is provided with a curved track portion 3 at its rear end and at the outer face of each track portion is a rib 4 the utility of which will hereinafter appear. The side frames are united by connecting rods 5 spanning the space between them and having their ends seated in the webs of the frames. On the connecting rods are distance sleeves 6 that serve to hold the frames in upright positions and parallel with each other.

7 designates the main drive shaft of the mill journaled in boxes 8 mounted on the sides of the husk frame (see Fig. I). This drive shaft is equipped with a drive pulley 9 adapted to receive a driving belt leading from any suitable source of power supply.

10 designates a pair of swinging arms preferably of sector shape and having their forward and narrowest portions loosely fitted to the drive shaft 7 in order that the arms may rock thereon and move in the arc of a circle. The rear portions of the swinging arms are preferably curved to correspond in contour to the rear portions of the side frames 2. Each swinging arm 10 is provided at its rear end with a flange 11 that overlaps the track portion 3 of the side frame 2 to ride thereon. At the inner side of the flange 11 of each swinging arm is a groove 12 that receives the adjacent rib 4 on the corresponding side frame track portion 3, thereby providing for the maintenance of the swinging arms in positions parallel to said side frames.

13 and 14 designate respectively upper and lower cross bars connecting the rear ends of the swinging arms 10, the said cross bars being provided with extensions 13′ and 14′ which project beyond the swinging arm at the side of the mill at which the log carriage is located. For the purpose of imparting vertical swinging movement to the swinging arms and their connecting cross bars, I attach to one of the swinging arms, preferably that located nearest the log carriage, a hand lever 15 which is loosely mounted on the drive shaft 7 and is provided with a detent 16. The detent of this lever is adapted to engage in either of a plurality of notches, preferably two in number, of a rack segment 17 fixed to the husk frame 1 adjacent to the forward end of the swinging arm to which the hand lever 15 is attached. By this means the swinging frame, consisting of the arms 10 and cross bars 13 and 14 may be retained in any position to which it may be swung, so that its position remains a fixed one during the sawing operation, to be hereinafter described.

18 designates a lower circular saw and 19 an upper circular saw, the latter being preferably of smaller diameter than the former. The lower saw is mounted upon a lower mandrel 20 journaled in boxes 21 supported by the lower cross bar 14. The mandrel 20 has fixed to it a drive pulley 22 driven by a belt to be hereinafter referred to and the mandrel is also equipped with a balance or fly-wheel 23.

24 is a mandrel that carries the upper cir-

cular saw 19 and which is journaled in boxes 25 carried by the upper cross bar 13. This mandrel has fixed to it a drive pulley 26 and is also equipped with a balance or fly wheel 27.

It will be seen that the upper saw is located slightly in advance of the lower saw, due to its mandrel being mounted in connection with the upper cross bar 13, that being located upon the curved flanges of the swinging arms 10 is positioned in front of a vertical line drawn through the cross bar 14 by which the mandrel of the lower saw is supported.

The boxes 25 in which the upper mandrel 24 is mounted are preferably rendered adjustable so that they may be raised and lowered for the purpose of permitting the use of upper saws 19 of varying diameters by either raising or lowering the upper mandrel journaled therein. I preferably secure this adjustment by the following mechanism: 28 are screw rods fitted to the boxes 25 and loosely seated in brackets 29 supported by the upper cross bar 13. These screw rods are equipped with beveled pinions 30. 31 is an operating rod loosely mounted in the brackets 29 and bearing beveled pinions 32 which mesh with the screw rod pinions 30. The operating rod 31 is provided with a hand wheel 33 by which it may be rotated to impart rotation to the screw rods 28 for the purpose of raising and lowering the boxes of the upper mandrel for the adjustment of the upper mandrel, as previously mentioned.

34 designates a counterbalance weight that is connected to one of the swinging arms 10 by a chain 35 operating upon pulleys 36 suitably supported above the mill mechanism. This counterbalance weight serves to balance the swinging arms and assist in their movement under their actuation by the hand lever 15.

37 designates a pulley fixed to the drive shaft 7 and 38 is a drive belt operating upon said pulley. This drive belt passes to and over the pulley 26 of the upper mandrel 24, thence downwardly and under the pulley 22 of the lower saw mandrel 20, thereby serving to drive one of said mandrels and its saw in one direction of rotation and the other mandrel and its saw in the opposite direction of rotation. From the pulley 22 the drive belt passes to and around an idler and belt tightener pulley 39 from which it returns to the pulley 37 on the main drive shaft. The idler and belt tightener pulley 39 is supported by a shaft 40 mounted in boxes slidably positioned in guides 41 supported by brackets 42 attached to the lower swinging arm connecting cross bar 14. To secure the belt tightening effect in the idler or pulley 39, I provide within the guides 41 springs 43, as seen most clearly in Figs. II and IV, that tend to press the boxes therein in a rearward direction and adjustment screws 44, which are adapted to bear against said springs to produce the desired degree of tension therein.

45 designates a log carriage that travels upon suitable track rails 46 adjacent to the mill mechanism previously described. This carriage for which no invention is herein claimed may be of any desired construction and driven by any suitable power mechanism. I have illustrated the power mechanism which I prefer to use, but for which no invention is herein claimed. The driving mechanism shown consists of the following parts: 47 is a cable traveling upon pulleys carried by the log carriage and wound around a drum 48 fixed to a shaft 49 (see dotted lines Fig. I and full lines Fig. III), the said shaft being provided with a spur wheel 50. 51 is a second spur wheel meshing with the spur wheel 50 and carried by a shaft 52 that extends into a housing 53. Within said housing is a worm wheel 54 (see dotted lines Figs. III and IV). 55 is a shaft extending at right angles to the shaft 52 and provided with a worm 56 that meshes with the worm wheel 54. 57 is a friction wheel slidably mounted upon the shaft 55 and adapted to be reciprocated thereon a hand lever 58 united by links 59 and 61 and a lever 60 connecting said parts. The friction wheel 57 opposes the face of a friction disk 62 mounted upon a shaft journaled in the husk frame 1. This friction disk is driven by a belt 63 leading from a pulley 64 carried by a driven shaft 65. The shaft 65 is driven by a belt 66 traveling upon a pulley 67 also upon said shaft and a pulley 68 upon the main drive shaft 7. By this means the main drive shaft is caused to impart rotation to the friction disk 62 and the log carriage may be driven at varying speeds determined by the position of the friction wheel 57 relative to the axis of said friction disk. The hand lever 58 has connection with the friction disk 62 whereby said disk may be moved to and from the friction wheel 57 in starting and stopping the log carriage driving mechanism.

In the practical use of my saw mill the log carriage travels to and fro upon its track in the usual manner. As it moves upon its forward stroke the lower saw 18, rotating in a direction facing that in which the log approaches it, cuts through the log in the usual manner until the far end of the log is reached. The swinging frame, consisting of the swinging arms 10 and the connecting cross bars is then swung downwardly by moving the hand lever 15 in a rearward direction whereby the upper saw 19, which is not in position to cut during the forward cutting stroke is lowered to the position seen in dotted lines Fig. II. Then upon the rear stroke of the log carriage the upper saw in its lowered position and driven in a direction the reverse of the direction of rotation of the lower saw, rotates in a direction facing the log on its return stroke

and cuts therethrough in a manner corresponding to that in which the lower saw made its cut on the previous forward stroke of the log carriage. After the log carriage has reached the end of its return stroke the operator returns the swinging frame and the saws to their first positions and the same operation as before is repeated continuously, the saws being alternately lowered and raised to provide complete cutting action upon both strokes of the log carriage. By this procedure as provided for in my improvement, continuous cutting action upon both strokes of the log carriage is obtained, except for the slight interim occasioned by reversing the direction of travel of the log carriage and shifting the saw carrying frame after each cut is made. The capacity of the mill is therefore approximately double that of a mill in which a cut is made in only one direction of travel of the log.

I claim as my invention:

1. In a sawmill, the combination with a log carriage and means for reciprocating said carriage, of a husk frame, a swinging frame having a guide flange, stationary means supported by said husk frame and to which said swinging frame is fitted, a guide member supported by said husk frame and having a track portion for directing the movement of said swinging frame by the engagement of the guide flange of the swinging frame therewith, a pair of circular saws supported by said swinging frame and arranged in the same vertical plane and in alinement with said carriage, and means for rotating said saws, substantially as set forth.

2. In a sawmill, the combination with a log carriage and means for reciprocating said carriage, of a husk frame, a swinging frame having a curved guide flange, stationary means supported by said husk frame and to which said swinging frame is fitted, a guide member supported by said husk frame and having a curved track portion for directing the movement of said swinging frame by the engagement of the curved flange of the swinging frame therewith, a pair of circular saws supported by said swinging frame and arranged in the same vertical plane and in alinement with said carriage, and means for rotating said saws; said saw rotating means being arranged to drive said saws in opposite directions of rotation relative to each other, substantially as set forth.

3. In a sawmill, the combination with a log carriage, and means for reciprocating said carriage, of a husk frame, a swinging frame having a curved guide flange, stationary means supported by said husk frame and to which said swinging frame is fitted, a guide member supported by said husk frame and having a curved track portion for directing the movement of said swinging frame by the engagement of the curved flange of the swinging frame therewith, a pair of circular saws supported by said swinging frame and arranged in the same vertical plane and in alinement with said carriage, and means for rotating said saws, said saw rotating means being arranged to drive said saws in opposite directions of rotation relative to each other; said guide flange being grooved and the guide portion of said guide member being provided with a curved rib loosely fitted in said groove, substantially as set forth.

4. In a sawmill, the combination of a swinging frame, a pair of mandrels supported by said frame, a circular saw carried by each of said mandrels, means for adjusting the position of one of said mandrels relative to the other mandrel, and means for driving said mandrels to impart rotation to said saws, substantially as set forth.

CHRISTIAN J. ZEITINGER.

In presence of—
E. S. KNIGHT,
BLANCHE HOGAN.