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LOG LOADER AND STOP FOR DOUBLE CUTTING BAND SAW MILLS.

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LOG LOADER AND STOP FOR DOUBLE-CUTTING BAND-SAW MILLS.

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To all whom it may concern:

Be it known that I, EDWIN E. THOMAS, of St. Paul, Ramsey county, Minnesota, have invented certain new and useful Improvements in Log Loaders and Stops for Double-Cutting Band-Saw Mills, of which the following is a specification.

The invention relates to sawmill machinery, and particularly to devices used in connection with single and double acting or cutting band-saws.

The object of the invention is to provide means for securely holding the logs on the deck preparatory to sawing them and moving them from the deck to the carriage as fast as they are needed.

The invention consists generally in providing an improved log-stop adapted for use with the deck of either a single or double cutting band-mill.

Further, the invention consists in providing improved log-kickers.

Further, the invention consists in improved means for bridging the space between the log-deck and the carriage of a double-cutting mill.

Further, the invention consists in improved means for operating the log stops and kickers of a single-cutting mill and the stops, bridging means, and kickers of a double-cutting mill.

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 plan view showing my invention adapted for use in connection with the deck of a double-cutting mill. Fig. 2 is a vertical section showing the manner of supporting and operating the mechanism. Fig. 3 is a detail section on the line \( x-x \) of Fig. 1.

In the drawings, \( a \) represents a portion of the frame, \( b \) a head-block, and \( c \) a knee, of the band-saw-mill carriage. The log bed or deck which I employ is of the usual construction, inclined toward the carriage, its upper surface being indicated in Fig. 2.

In band-saw mills of the double acting or cutting type a cut is made in the log on the backward as well as the forward movement of the carriage, and it is necessary to space the carriage from the deck and provide means therein to receive and carry away the lumber that is cut from the log on the return movement of the carriage. The means which I employ for this purpose consists, preferably, of an endless conveyer or carrier \( a \), disposed between the deck and the carriage upon suitable bearings; but as said conveyer forms the subject-matter of a companion application of even date herewith further description is unnecessary, except to say that it is located below the level of the head-blocks and the deck and necessitates the employment of bridging means to carry the logs from the deck to the carriage. This bridging means forms one of the essential features of this invention and will hereinafter be more particularly described.

At the front of the log-deck on each side I provide timbers \( 6 \) and \( 7 \), whereinto floor-plates \( 8 \) are bolted below the level of the log-deck, so as not to interfere with the free movement of the log. These floor-plates are provided with guide slots or openings \( 9 \), wherein stop-bars \( 10 \) are vertically slidable. These bars project above the log-bed substantially at right angles to its surface and present substantial positive stops to prevent premature discharge of the logs. At a suitable distance beneath the floor-plates \( I \) provide a horizontal rock-shaft \( 11 \), having bearings \( 12 \) at each end upon suitable timbers \( 13 \). This shaft \( 14 \) is provided at each end with a multiple crank, substantially triangular in form, secured near its apex on said shaft and pivotally connected at one of its corners to the stops \( 10 \). The opposite corners of said cranks are pivotally connected by rods \( 15 \) with quadrant-shaped kickers \( 16 \), that are pivoted within recesses in said floor-plates and have, preferably, sockets \( 17 \), wherein pivotal connections are made with the rods \( 15 \). The kickers have curved faces \( 18 \), conforming substantially to the curved surfaces of the logs. The shaft \( 11 \) is provided with a rock-arm \( 19 \), connected with the rod \( 20 \) of a piston provided within a cylinder \( 21 \), admission of steam to which...
being controlled by a suitable valve having a stem 22, that is connected in the usual manner with the sawyer's lever. This portion of the mechanism being of common construction does not need detailed illustration or description. In the rear of the shaft 11 are pivotally connected brackets 23, mounted on blocks 24, that are supported on the timbers 13. These brackets have slotted openings 25, wherein sway-bars 26 are pivoted at points intermediate to their ends. These sway-bars are adapted to swing in vertical planes in the rear of and substantially in line with the planes of the multiple cranks 14, and the lower ends of said bars are pivotally connected by links 27 with said cranks at points intermediate to the pivots of said bars 10 and rods 15. The upper ends of the sway-bars are pivotally connected with slide-bars 28, that are adapted to reciprocate horizontally in guides 29, provided in said floor-plates, and when projected beyond the front of the deck to bridge the space between the deck and the carriage above the endless lumber conveyor.

The mechanisms are shown in their normal position in Fig. 2, with the stops projecting a sufficient distance above the log-deck to retain the logs thereon and the kickers below the level of the deck out of the path of the logs and the bridge-bars withdrawn from the front of the deck ready to be projected across the space between the deck and the carriage. When it is desired to load a log onto the carriage, the sawyer will rock the shaft 11, setting the multiple cranks in motion and drawing down the stop-bars out of the path of the logs. These bars in their initial movement are substantially tangential to arcs drawn through the pivotal connections of said bars with said cranks and whose centers coincide with the center of said shaft, and hence the bars will move substantially in line with the direction of movement of said pivots and when said cranks are actuated will be quickly withdrawn below the level of the deck out of the path of the logs.

As indicated in Fig. 2, the pivotal connections of the rods 15 with said cranks will be below the shaft 11, and said rods will be nearly at right angles with arcs drawn through their pivots from the center of said shaft. Consequently the initial movement of said rods will have but little effect on the kickers. In fact at the beginning of the movement of said rods the kickers will be drawn down slightly before beginning their upward stroke. As soon, however, as the rods 15 reach a point where their movement is in line with the movement of their pivotal connections with said cranks the kickers will begin to move rapidly to the limit of their stroke.

As soon as the shaft and the cranks 14 are rocked the sway-bars 26 will be set in motion, and by the time the kickers are up level with the deck the bridge-bars will be projected partially across the space between the deck and the carriage, and as the cranks move on to the limit of their stroke the bridge-bars will be projected entirely across the space and will reach the limit of their stroke about the time the kickers reach theirs. The bridge-bars are always ahead of the log and present a firm substantial support for the passage of the logs from the deck to the carriage. The stop-bars in their normal position are substantially vertical and present perpendicular bearing-surfaces to the logs, so that the weight of the logs has no tendency to depress the stops and operate the piston.

The stop-bars will move to a point below the level of the deck before the kickers rise above it, and hence if the power mechanism is inoperative for any reason the stops may be withdrawn from the path of the logs by rocking the shaft, steam being off the cylinder, and the logs rolled off the deck by hand.

I have shown the stop-bars and kickers operating in connection with the horizontally-moving bridge-bars for use with a double acting or cutting band-mill. When, however, the apparatus is used with a single-cutting mill where the carriage stands close to the front of the deck, the bridge-bars will of course be dispensed with and can readily be disconnected from the oscillating cranks without affecting the operation of the stop-bars or kickers.

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

1. The combination, with a log-deck, of vertically-sliding stops, oscillating log-kickers pivotally supported near the top of the log-deck, means for operating said stops, and kickers and said stops being moved out of the path of the log before the kickers engage the same, substantially as described.

2. The combination, with a log-deck, of reciprocating stop-bars normally projecting above the deck, oscillating kickers normally below the deck, means for operating said bars and kickers the former moving rapidly during the first part of their stroke and the latter during the last part of their stroke, substantially as described.

3. The combination, with a log-deck, of vertically-sliding stops, oscillating kickers pivotally connected with both said stops and said kickers, and means for rocking said shaft, substantially as described.

4. The combination, with a log-deck, of vertically-sliding stops, oscillating kickers, a rock-shaft, triangular or quadrant shaped cranks secured near their ends on said shaft, said stops and said kickers being pivotally connected with said cranks at or near the other ends and opposite edges of said cranks, substantially as described.

5. The combination, with a log-deck, of a rock-shaft, cranks secured thereon, stops normally projecting above the level of said deck,
kickers pivotally supported near the top of said deck and normally below the level of the same, and said stops and said kickers having pivotal connections with said cranks and said connections being respectively above and below said shaft when said stops and kickers are in their normal position, substantially as described and for the purpose specified.

6. In a double-cutting band-saw mill, the combination, with a log-deck, of a carriage spaced therefrom, log stops and kickers, horizontally-moving means to bridge the space between the deck and the carriage, a rock-shaft, cranks thereon wherewith said stops, kickers and bridging means have independent pivotal connections, and means for rocking said shaft, substantially as described.

7. In a double-cutting band-saw mill, the combination, with a log-deck, of a carriage spaced therefrom, log stops and kickers, sliding means to bridge the space between said deck and carriage, and means for operating said stops, kickers and said sliding means, substantially as described.

8. In a double-cutting band-saw mill, the combination, with a log-deck, of a carriage spaced therefrom, log stops and kickers, reciprocating bars for bridging the space between said deck and the carriage, and means for operating said stops, kickers and said bars, substantially as described.

9. In a double-cutting band-saw mill, the combination, with a log-deck, of a carriage spaced therefrom, log stops and kickers, horizontally-sliding bars for bridging the space between said deck and carriage, and operating means for causing rapid movement of said stops and kickers at the beginning and during the last part, respectively, of their stroke, substantially as described.

10. In a double-cutting band-saw mill, the combination, with a log-deck, of a carriage spaced therefrom, vertically-sliding stops, oscillating kickers, horizontally-sliding bars for bridging the space between said deck and carriage, and means for operating said stops, kickers and bars, substantially as described.

11. In a double-cutting band-saw mill, the combination, with a log-deck, of a carriage spaced therefrom, vertically-sliding stops, oscillating kickers, sliding bars for bridging the space between said deck and carriage, a rock-shaft, cranks thereon having pivotal connections with said stops, said kickers and said bar, and means for rocking said shaft, substantially as described.

12. In a double-cutting band-saw mill, the combination, with a log-deck, of a carriage spaced therefrom, horizontally-sliding means for bridging the space between said deck and carriage, and means for operating the said sliding means, substantially as described.

13. In a double-cutting band-saw mill, the combination, with a log-deck, of a carriage spaced therefrom, a rock-shaft, cranks secured thereon, log stops and kickers having independent pivotal connections with said cranks, sway-bars, horizontally-sliding bars connected with said sway-bars and adapted to bridge the space between said deck and said carriage, and links pivotally connecting said sway-bars with said cranks at points intermediate to the pivotal connections of said stops and kickers, substantially as described.

In witness whereof I have hereunto set my hand this 3d day of August, 1901.

EDWIN E. THOMAS.

In presence of—

RICHARD PAUL,

M. C. NOONAN.