

(No Model.)

2 Sheets—Sheet 1.

E. E. THOMAS.  
STEAM LOG TURNER AND NIGGER.

No. 579,779.

Patented Mar. 30, 1897.

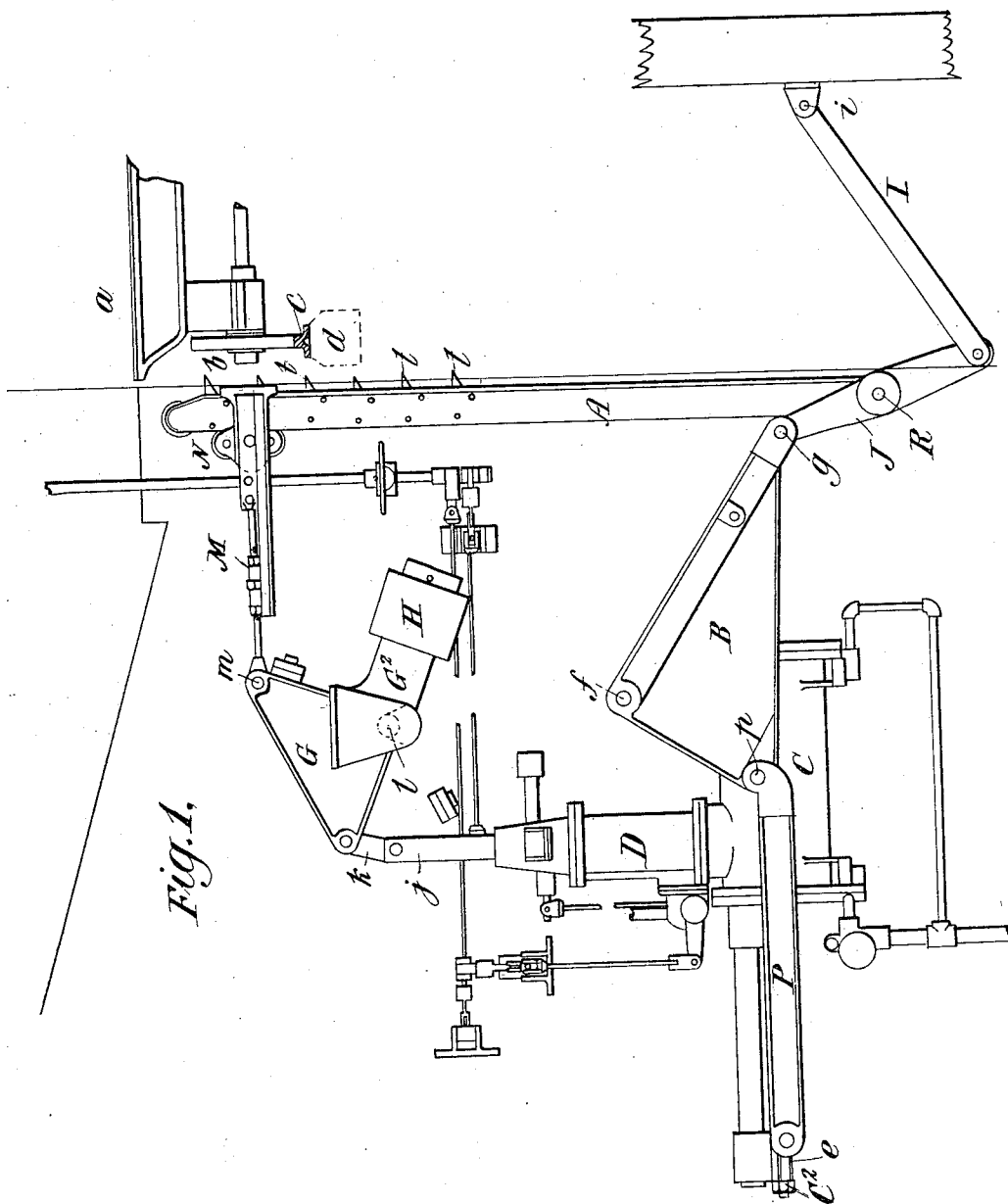


Fig. 1.

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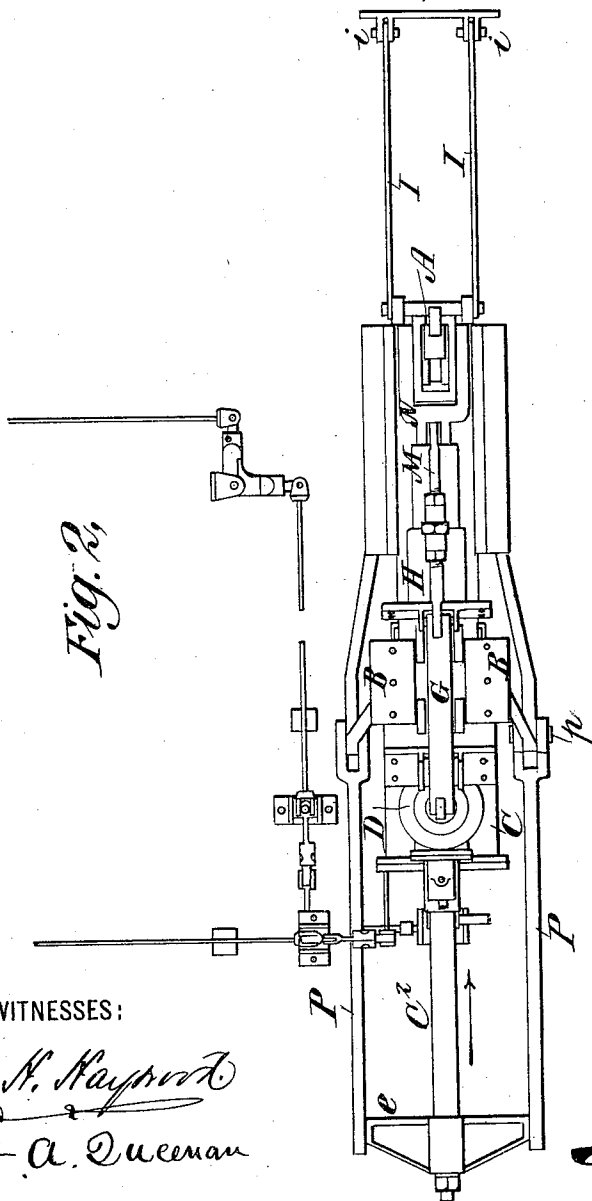
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WITNESSES:

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# UNITED STATES PATENT OFFICE.

EDWIN E. THOMAS, OF BAY CITY, MICHIGAN, ASSIGNOR TO THE M. GARLAND COMPANY, OF SAME PLACE.

## STEAM LOG-TURNER AND NIGGER.

SPECIFICATION forming part of Letters Patent No. 579,779, dated March 30, 1897.

Application filed November 6, 1896. Serial No. 611,233. (No model.)

*To all whom it may concern:*

Be it known that I, EDWIN E. THOMAS, of Bay City, in the county of Bay and State of Michigan, have invented a certain new and useful Improved Steam Log-Turner and Nigger, 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 what is known in sawmill machinery as a "steam log-turner and nigger," that is, a machine operated by steam and adapted to perform the operations of shifting or turning the log axially on a sawmill-carriage and for also knocking or forcing the log bodily and laterally into place on the carriage.

Various constructions of this type or class of machine have been devised, but I propose to provide for use a steam log-turner and nigger which, while perfectly efficient for all the purposes for which such a machine is designed, will be easier of management and will require much less steam in operation to effect the same amount of work.

To these main ends and objects my invention may be said to consist, essentially, in the novel construction of machine or in the novel combinations of devices, which will be found hereinafter more fully described and which will be most particularly pointed out in the claims of this specification.

To enable those skilled in the art to which my invention relates to make and use machines embodying the same, I will now proceed to more fully describe my improvement, referring by letters to the accompanying drawings, which form part of this specification and in which I have shown my invention carried into effect in precisely that form or detail construction of machine which I have so far built and successfully operated.

In the drawings, Figure 1 is a side elevation of my improved steam log-turner and nigger. Fig. 2 is a plan view of the same.

In the figures the same part will be found always designated by the same letter of reference.

In Fig. 1 I have illustrated a portion of the log-carriage of the mill in order to show the usual relationship of the toothed bar of the

log-turner and nigger to the carriage carrying the log to be manipulated, while in Fig. 2 I have, however, omitted any representation of any part of the carriage to simplify the drawing.

*a* is part of an ordinary log-carriage mounted, as usual, so that the truck-wheels *b* at the inner side of the carriage travel on plain rails *c*, securely mounted on the track-beam *d* of the mill.

*A* is the vertically-arranged toothed bar, which operates by an up-and-down or vertical movement bodily to turn a log on the carriage *a* by the action on the log of its pivoted projecting teeth *t* in the well-known manner, and which, when in a sufficiently-elevated position bodily, operates by a vibratory or back-and-forth movement of its upper end as a nigger to knock or force the log laterally or sidewise into place on the log-carriage, and these up-and-down movements bodily of the toothed bar *A* and vibratory or back-and-forth movement of its upper end are effectuated separately by means of two steam-cylinders *C* and *D* and bell-crank devices and certain connections between them and the cylinders on the one hand and the toothed bar *A* on the other hand, as I will now explain.

The steam-cylinder *C* is placed horizontally, as shown, and has the outer end of its piston-rod *C*<sup>2</sup> connected by a cross-head *e* to the ends of two connecting-rods *P P*, the opposite ends of which are coupled at *p* to the lower forward ends of the bifurcated front arm of a bell-crank *B*, which turns upon a fixed axis or pivot at *f*, the longer forwardly-extending arms of this bell-crank *B* being pivotally connected at *g* with the upper ends of two similar levers *J*, arranged on the opposite sides or faces of the toothed bar *A* and pivotally connected therewith, as shown, at *R*. The lower ends of the levers *J* are pivoted to the outer ends of the vibratory arms *I*, which at their opposite ends are pivoted to fixed points *i*, all as clearly shown.

The upper end portion of the toothed bar *A* is as usual confined between suitable guides or guideways, within which it is free to move up and down, and by the arrangement of the horizontal steam-cylinder *C* and the other

parts or devices just above described the up-and-down movement of said toothed bar is effectuated as follows: Supposing the bar and all the parts to be in the position shown in the drawings, by admission of steam to one end of the cylinder C the piston of said cylinder is forced, of course, in the direction indicated by the arrow at Fig. 2, and this stroke of the piston causes the connected pitmen P P to vibrate the bell-crank B on its axis of motion at *f* in such manner and direction as to cause the pivotal connections R of the levers J to bodily lift or vibrate the toothed bar A, the said bar moving substantially in a vertical line by reason of the arrangement shown of the vibratory arms I, the pivotally-connected levers J, and the vibratory ends of the actuating bell-crank B, pivotally connected at *g* to the upper ends of the said levers J. After having been lifted by the action of the steam-cylinder C, as just explained, the toothed bar or beam A will, during the exhaustion of the supply of steam admitted to one end of cylinder C, descend by gravity, while by the same means the piston of the cylinder with its rod and the other connecting devices will all resume the position illustrated in the drawings. Thus it will be seen that to effectuate the lifting and depression of the toothed bar A in the performance of the log-turning operations only sufficient steam is used to drive the piston of the cylinder C (the requisite number of strokes) in one direction, all the parts at each rise and fall of the toothed bar A being returned to their original or normal positions by the gravity of the parts, and hence a great saving is effected over the prior constructions of log-turners, in which it is necessary to use a sufficient supply of steam to work the parts in both directions. As, however, the toothed bar has to be pressed laterally toward and against the log during the upward movement of the bar with sufficient force to insure the proper turning of the log, I have devised a novel and very important contrivance or means for this purpose instead of (as usual in log-turners) using the upper and smaller steam-cylinder for the purpose of thus enforcing or pushing the upper end of the toothed bar laterally against the log. The bell-crank G is formed or provided with a forwardly-projecting arm C<sup>2</sup>, on which is mounted an adjustable counterweight H, the function and effect of which, as will be clearly seen by reference to Fig. 1, are to exert a constant tendency to turn the bell-crank G on its fulcrum point of support in the proper direction to make its upper end actuate the pitman which connects the latter with the upper end of the toothed bar A in the proper direction to force said bar or its upper portion laterally against the log which is being turned on the carriage, and by a proper adjustment of this counterweight, (or perhaps, more properly speaking, this gravity-motor,) according to the average size of the logs being turned, the operator of the machine causes the oper-

ation of the latter to be such that this weight will always hold the upper end or portion of the toothed bar with sufficient force against the log to insure the proper log-turning effect without bringing into use at all the small cylinder D, which in all machines heretofore made (that I know of) has been used to press forwardly the upper end of the toothed bar and by its coaction with the other steam-cylinder (which effects the vertical lifting of the bar) induce to the proper duplex action of said toothed bar in the log-turning process. I consider this peculiarity of construction, whereby I am thus enabled to dispense wholly with the use of the upper supplementary steam-cylinder during the log-turning operation, of great importance not only because of the saving of steam-power generally expended during this operation in the use of the said cylinder, but, furthermore, because in machines as heretofore constructed it is exceedingly difficult and dangerous with a new hand or inexperienced operator to perform the log-turning operation on account of the difficulty in successfully managing the valve mechanisms of both steam-cylinders at the same time and the liability of causing or permitting the cylinder which effectuates the lateral movement of the upper end of the toothed bar to press said bar toward and against the log too suddenly and forcibly, and thus cause the log to be lifted and pushed over the tops of the carriage-knees onto the men who work on the carriage.

In order to vibrate the upper end of the toothed bar A about its lower pivotal supports R simply to push or knock the log laterally into position on the carriage *a*, in the usual manner of a "steam nigger," it is only necessary, when the toothed bar A is placed in the sufficiently-elevated position, to alternately supply steam by the usual valvular devices to the upper and lower ends of the vertical steam-cylinder D to cause the necessary up and down strokes of its piston-rod *j*, which, as shown, is coupled by link to one corner or angle of the bell-crank G, that is pivoted on a fixed axis at *l* and having its uppermost angle or arm coupled at *m* to one end of the pitman M, that is coupled at its other end to the slide or carriage N, which embraces and controls the upper end portion of the toothed bar A. The said carriage N is mounted to move or slide horizontally in suitable fixed ways or supports and partially embraces the upper portion of the bar A in such a manner that when the latter, with its projecting teeth *t*, is free to slide vertically within the embrace of said carriage the latter operates to vibrate or move said toothed bar laterally or back and forth for the purpose above mentioned.

By the arrangement of the main cylinder C for effecting the lifting of the toothed bar A in a horizontal position, as shown, and the combination, with said cylinder and said bar, of the system of levers shown and described I am enabled not only to translate the hori-

zontal stroke of the piston of said cylinder into a perfectly vertical movement of the bar A, but I am also enabled to actuate said bar without any sliding frictional movements of any of the moving parts of the machine, and I furthermore am enabled to place the machine in low mills, since I only require about nine feet space from the top of the log-carriage head-blocks down to the base of the machine, which latter should always be above ground, and by the placement of the small cylinder D in a vertical position and on top of the larger cylinder C, I get a secure or solid foundation for the smaller cylinder and an arrangement which renders the machine, as a whole, self-containing and more rigid and durable in practical use.

As will be readily understood, of course, not only is my machine exceedingly economic of steam-power by reason of the use of steam in the larger cylinder C only for the purpose of lifting the toothed bar A and the use of steam in the smaller cylinder D only for the purpose of vibrating the upper portion of said bar when used to push or knock the logs onto the log-carriage, but, furthermore, by the combinations of parts shown and described I produce a machine which is more desirable and efficient in operation than any heretofore made (that I know of) and also one which, as heretofore explained in the log-turning operation, may be more easily and safely managed than machines heretofore in use.

Having now so fully explained the construction, the operation, and the supposed advantages of my improved machine that those skilled in the art can make and use the same, what I claim as new, and desire to secure by Letters Patent, is—

1. In a steam log-turner and nigger, the

combination, with the usual toothed bar, for turning the log; and means for moving said bar laterally at its upper end, of a steam-cylinder placed in a horizontal position, to effectuate the lifting of said bar; and a system of levers connecting the piston of said cylinder with the lower end of said bar, and operating to translate the horizontal stroke of the piston into a vertical movement of said bar; all substantially as hereinbefore set forth.

2. In a log-turner and nigger, the combination, with the usual toothed bar, adapted to both turn the log and push it onto the carriage, of a steam-cylinder the piston of which is connected, to the upper portion of said bar through the medium of pitman and bell-crank; and an adjustable weight arranged on one arm of said bell-crank and adapted to act as a motor to push and hold the toothed bar against a log, during the log-turning operation; as hereinbefore set forth.

3. In a log-turner and steam-nigger, the combination with the toothed bar; a horizontally-placed steam-cylinder; and a system of levers for effectuating the lifting of said bar; of a steam-cylinder arranged vertically and mounted on said horizontally-placed cylinder; and suitable connections between said vertically-placed cylinder and the upper part of said bar for causing the proper lateral movements of the bar in performing the nigger operation; all substantially as hereinbefore set forth.

In witness whereof I have hereunto set my hand this 12th day of September, 1896.

EDWIN E. THOMAS.

In presence of—

M. L. COURTRIGHT,  
H. J. AUGER.