(No Model.) 4 Sheets—Sheet 1.

F. L. DAY.

MACHINE FOR SAWING BLOCKS FROM LOGS.

No. 518,589. Patented Apr. 24, 1894.

Fig. 1.

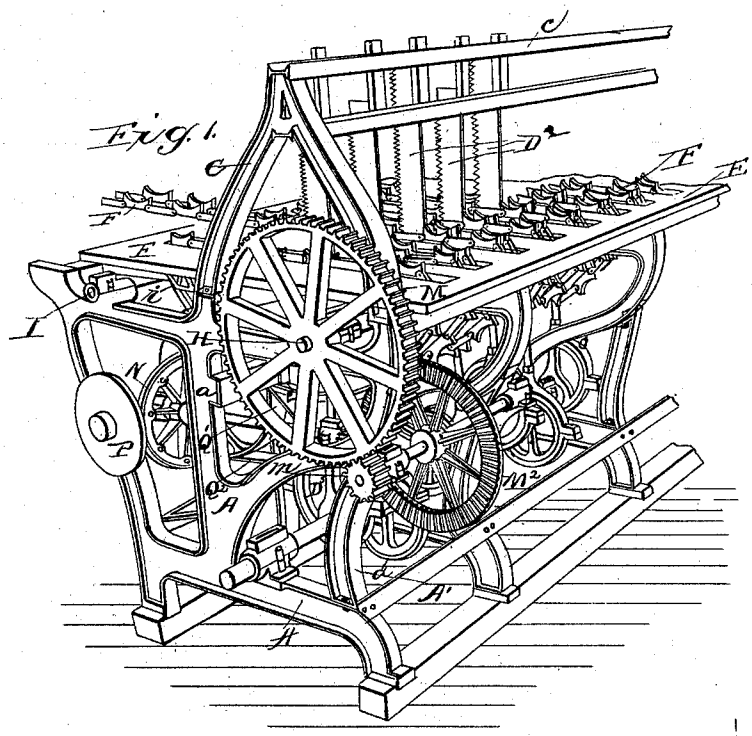


Fig. 4.

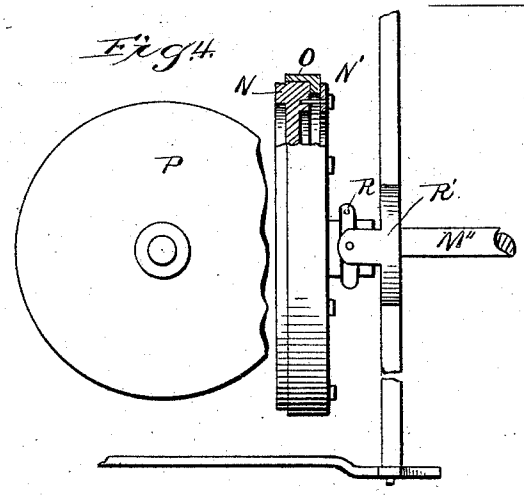
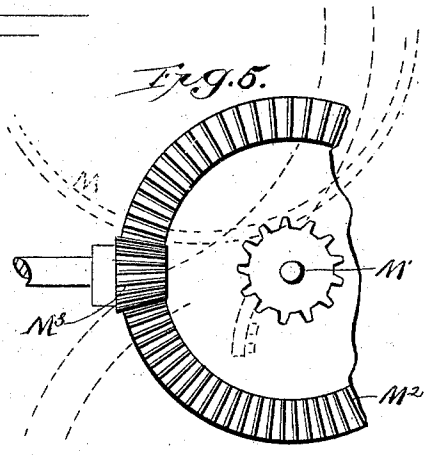


Fig. 5.



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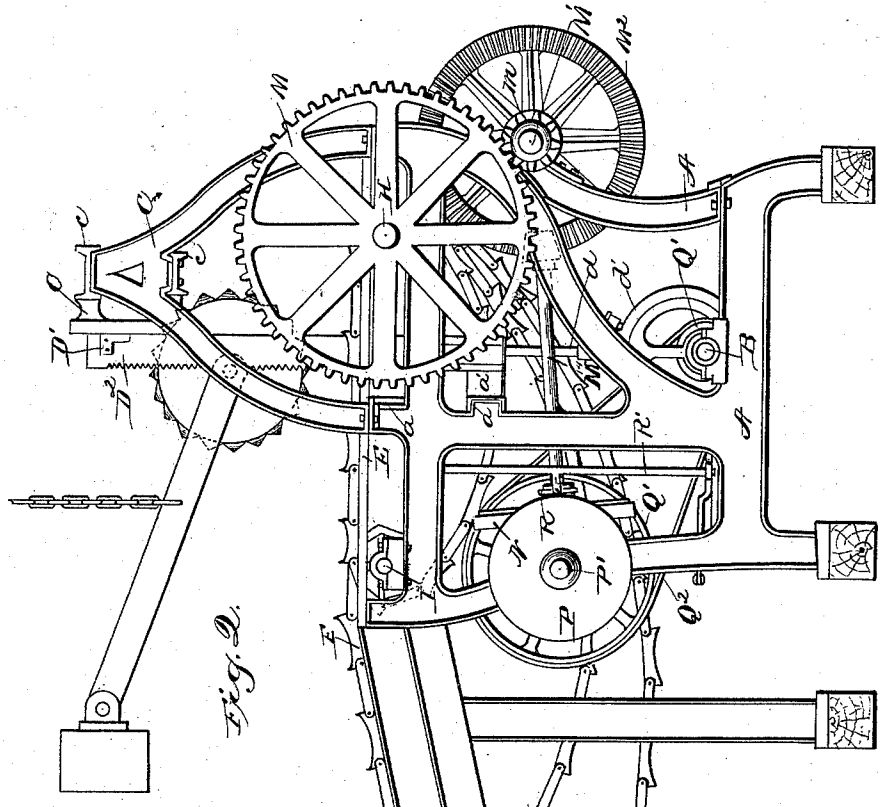

Fig. 2.

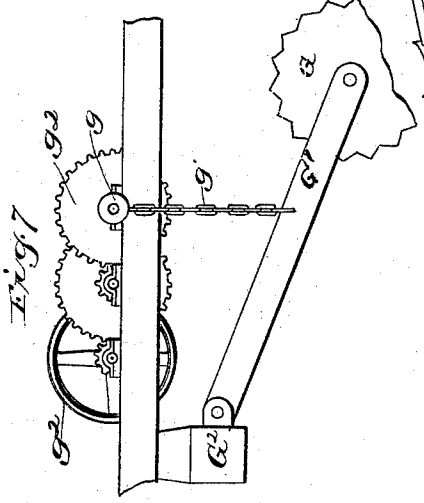

Fig. 7.

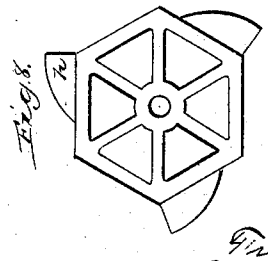

Fig. 8.

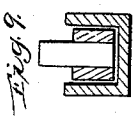

Fig. 9.

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MACHINE FOR SAWING BLOCKS FROM LOGS.

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Fig. 3.

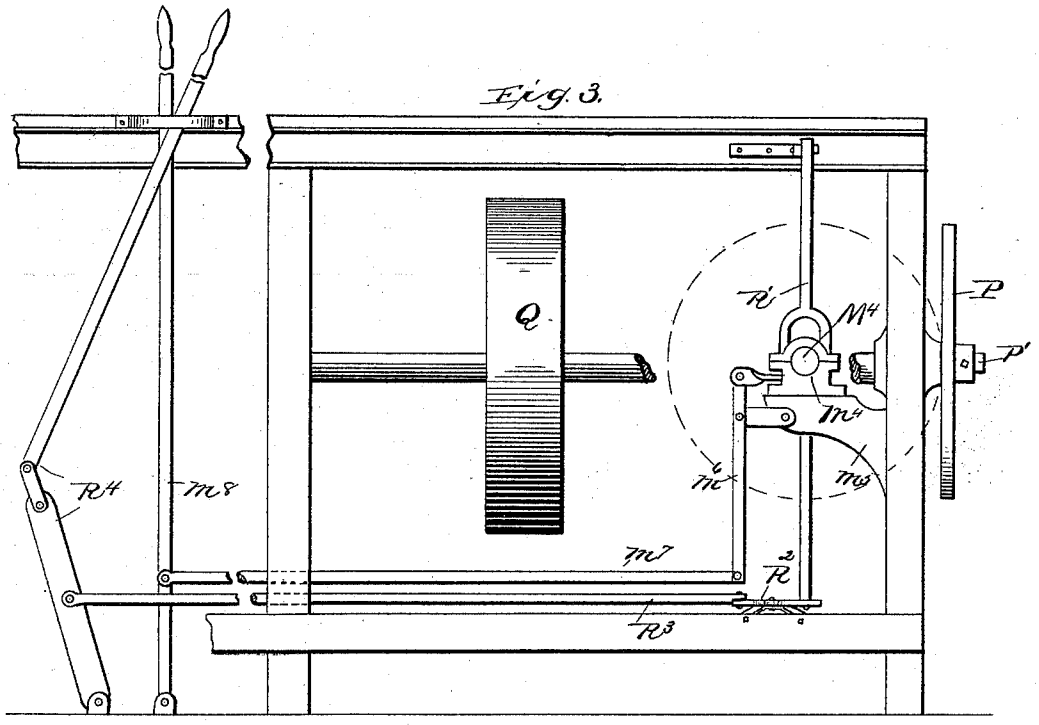
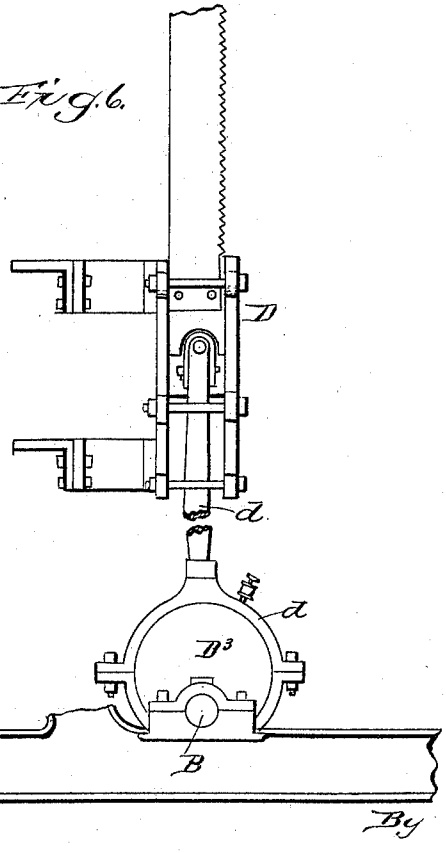


Fig. 6.



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F. L. DAY.

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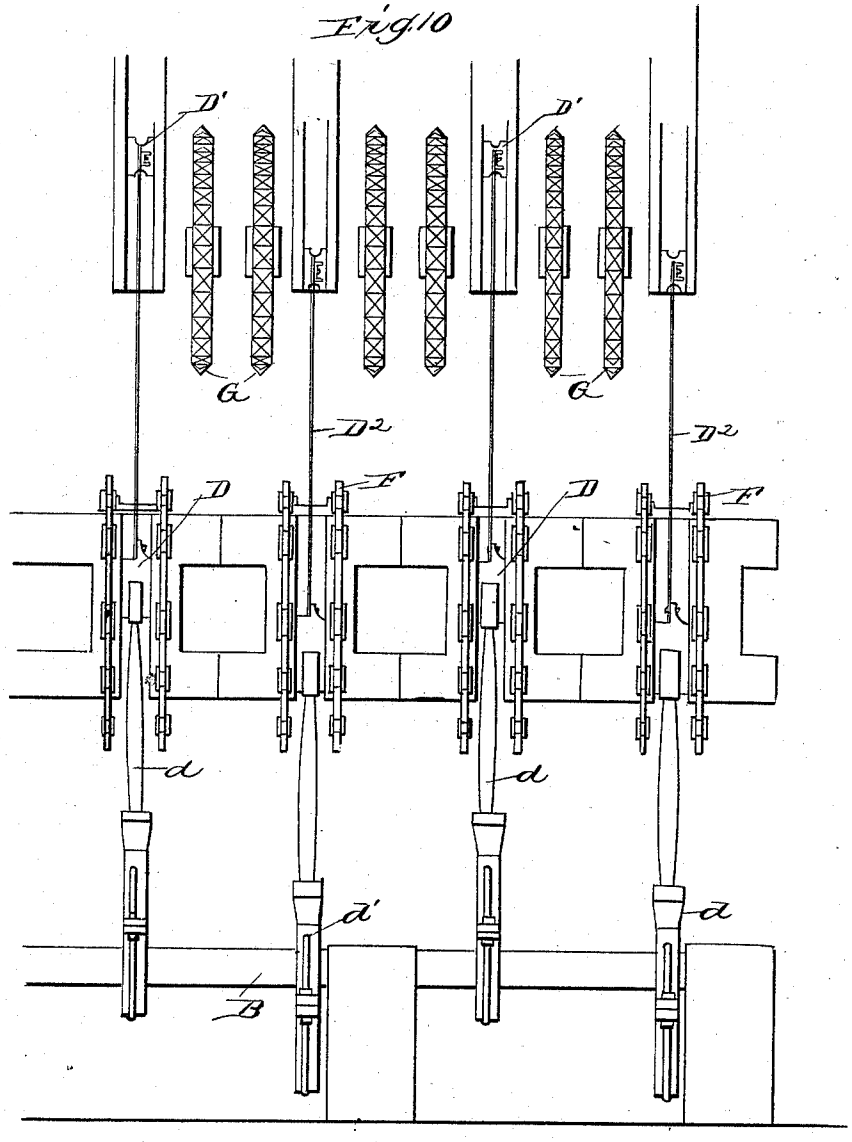
Fig 10



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UNITED STATES PATENT OFFICE.

FRANK L. DAY, OF GLENS FALLS, NEW YORK.

MACHINE FOR SAWING BLOCKS FROM LOGS.

SPECIFICATION forming part of Letters Patent No. 518,589, dated April 24, 1894.

Application filed September 15, 1893. Serial No. 485,584. (No model.)

To all whom it may concern:

Be it known that I, FRANK L. DAY, of Glens Falls, in the county of Warren and State of New York, have invented certain new and useful Improvements in Machines for Sawing Blocks from Logs; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the letters of reference marked thereon.

This invention relates to improvements in machines, more especially designed for sawing, butting or subdividing logs into blocks of proper size for pulp grinders, although capable of use in subdividing logs transversely for many of the well known industries, such as for making shingles, &c. Great difficulty has been experienced in providing a machine with large capacity for accomplishing this desired end, for while it is not difficult to subdivide a single log by successive transverse cuts into blocks, the difficulties are vastly increased when it is attempted to butt or convert the entire log into blocks by a single operation, and still further increased when it is attempted to successively and by a continuous operation butt or cut a great number of logs. These difficulties are due largely to the fact that mechanism has not been heretofore provided for handling the logs before presenting them to the cutters or saws, and for controlling them while being presented to the saws and cut, as well as after being cut, and further, to the want of proper means for securing a uniformity of action throughout the cutting operation and of means for instantly arresting or varying the feed, should the condition of the stock being operated on at any moment demand it. In my present machine, my aim has been to overcome these difficulties and to provide a comparatively simple machine of very large capacity easily controlled and handled by a few operators.

Referring now to the accompanying drawings: Figure 1 is a perspective view of a portion of the machine showing the relative position and arrangement of the various parts. Fig. 2 is an end elevation of the machine set up for operation, portions of the interior mechanism being omitted to prevent confusion. Fig. 3 is a detail rear elevation of the feed controlling mechanism. Fig. 4 is a detail end elevation of part of the mechanism shown in Fig. 3, with portions broken away to show underlying parts. Fig. 5 is a detail elevation of part of the feed mechanism shown in Fig. 2, with the frame broken away. Fig. 6 is a detail section showing the lower carriage for one saw and drive cam therefor. Fig. 7 is a section showing the elevating mechanism for the presser rollers. Figs. 8 and 9 are details of one of the chain wheels and chain guide respectively. Fig. 10 is a diagrammatic sectional elevation showing the relative arrangement of the saws, feed chains, and driving mechanism.

Similar letters of reference in the several figures indicate the same parts.

The frame of the machine may be of any preferred or ordinary construction, but that illustrated has some special advantages, and consists essentially of a series, (the number depending on the width of the machine) of vertical skeleton frames A usually cast, and united by girders or U-irons, and suitable straps, into a solid structure. These frames A have removable sections A′ in their rear sides, bolted rigidly in place but capable of being readily removed to permit of the removal of the main drive shaft B and eccentrics, as will be readily understood from an inspection of the drawings.

Upon the top of the main frame at each end, is mounted a superstructure formed by end frames C united by beams or girders *c* corresponding to the girders *a*, but located in a vertical plane in rear of the same. These girders *a* and *c* form the bases for a series of guide brackets *a′* and *c′* provided with vertical guide ways, usually of T-recess pattern, for the accommodation of the saw carriages D D′ which latter, one above and the other below, are clamped to the ends of vertically reciprocating saws D^2. Saws D^2 are located approximately over the drive shaft before referred to, and the lower carriage D of each saw is jointed to a connecting rod *d*, extending down and provided at the lower end with a large bearing or strap *d′* working on an eccentric D^8 rigidly mounted on the drive shaft.

In order to neutralize as much as possible, the tendency to lift and roll the log being operated upon, the saws are arranged in two

separate gangs working simultaneously in opposite directions, each gang being therefore driven by eccentrics set on the drive shaft diametrically opposite the set for driving the other gang. This feature is of great importance, inasmuch as it is found impracticable to provide a mechanism for preventing the rotation and lifting of the logs when all the saws move simultaneously in the same direction, especially as the holding and guiding mechanism must extend between the saws so as to hold the blocks after they are sawed, and just before they are severed, when the connection between the blocks is very weak and the log liable to be thrown out of position by the action of the saws.

A further advantage in arranging the saws in two gangs moving in opposite directions simultaneously, is, that excessive vibration due to the stopping and reversal of so great a number of saws and parts connected, is neutralized, the result being that the machine may be operated without making special provision for its support. As will be readily understood, the logs are presented to the saws transversely so as to be severed into blocks by transverse cuts, and in order to hold the logs, feed them to the saws regularly and hold and convey the blocks away as they are cut, a table or platform E supported by the frame is arranged at the proper height with relation to the saws, and a series of pairs of feed chains F are caused to travel in guide-ways over this table between the saws and out on the rear side. Two chains are arranged to pass between each two saws, preferably one in proximity to each saw, and the upper sides of the links are properly shaped to receive and form a solid base or cradle for the logs clear across the machine, thus the logs have a solid support up to the saws and as the saws cut their way through, the blocks rest and are supported on solid supports at each end preventing all tendency to work out of place. The links of the chain preferably have points on the upper side, every other link being for this purpose formed solid in cross section and with a semi-circular concavity in the upper side as shown.

In moving across the table, the links are preferably arranged to move in unison and in ranks, *i. e.*, with similar links in rows extending from end to end of the machine, this being found to be advantageous in positioning the logs.

To hold the logs down solidly on the chains as they approach the saws and after the blocks are severed, a series of pairs of heavy presser rollers G are hung between the saws preferably by journaling them in the ends of arms G′ pivotally connected to an overhead frame G^3 as shown in Figs. 2 and 7; an elevating mechanism consisting of a shaft g connected by chains g' and having a hand wheel and train of gearing g^2 being provided for raising the wheels, should the feed be arrested or the logs thrown out of position by the approach of a large log or otherwise, thereby allowing the log to feed under the wheels. These presser wheels are provided with points or alternate elevations and depressions on their peripheries to cause them to take hold of the logs securely, and with a view to holding the partially severed log and block as they are cut, the wheels are preferably arranged approximately above the chains or between the chains as shown clearly in Fig. 10. Should it be desired to hold the logs and blocks some distance in front and rear of the line of cut, the number of presser wheels may be increased or one of the wheels of each pair may be located in advance of the other.

The feeding chains are as before stated, preferably arranged in pairs and they all run over sprocket wheels h on a chain drive shaft H located just below the level of the table or platform and driven through mechanism to be presently described. A shaft I corresponding to the shaft H is arranged at the front of the machine for carrying the sprocket wheels i to guide the chains at the front of the machine. Should means be provided for depositing the logs regularly and squarely on the chains at the front of the table shown in Fig. 1 all the chains might run over sprocket wheels on the shaft I but difficulty is experienced in positioning the logs properly and hence use is made of an inclined supplemental platform K (Fig. 2) and chains at or near each end of the machine are extended forward and run over pulleys or wheels k in the forward part of the supplemental platform K, thus, the logs may be positioned on two chains, one at each end, or more, if desired, and then as they are drawn up the platform the other chains, some of which preferably extend part way down the platform, are encountered and when the logs reach the saws they are supported on both sides of each saw and the parts do not change their relative positions when severed into blocks.

For moving the chains, the shaft H at the rear of the platform, is provided at one end with a large gear wheel M meshing with a pinion m on a counter shaft M′ journaled in bearings on the main frame, and in turn driven through a large bevel gear wheel M^2 meshing with a pinion M^3 on a shaft M^4 passing to the front of the machine and carrying a wheel N forming one of the members of a friction gear interposed in the feed drive gear. This friction wheel N is provided on its periphery with a friction material O such as leather, preferably held in place by a ring N′ which clamps an inwardly extending flange of the friction material against the side of the wheel. The periphery of the friction wheel is adapted to bear against the inner face of a friction disk P rigidly mounted on a shaft P′ journaled in bearings on the frame and driven from the main drive shaft through pulleys Q Q′ and belt Q^2.

Referring now particularly to Figs. 3 and 4, showing the friction gear in detail, it will

be seen that the rear end of the shaft M^4 is journaled in a bearing m^4 which is movable transversely on a supporting bracket m^5 and held in place by a lever m^6 connected by a rod m^7 with an operating hand lever m^8 extending up above the platform. This construction enables the friction wheel to be moved into or out of contact with the friction disk, and the attendant with his hand on the operating lever may thus control perfectly the feed of the logs to the saws and if necessary instantly stop or start the same. In addition to this mechanism for starting and stopping the feed, I provide a means whereby the rate of feed may be varied according to the work being done, and the speed at which the saws are driven. To accomplish this, the friction wheel is connected with the shaft M^4 by a spline and groove connection or equivalent so as to rotate with, but have a movement longitudinally of the shaft, thus by shifting the friction wheel, it may be made to contact with the disk at a greater or less distance from its center, as will be readily understood from an inspection of Fig. 4, wherein the wheel is shown provided with a grooved hub in which a collar R fits, and a bifurcated lever R′ fulcrumed on the main frame at the upper end, engages the collar to shift the wheel in one direction or the other. The lower end of the lever is connected to one arm of a bell crank lever R^2, the other arm being connected by rod R^3 with the operating handle R^4, located in proximity to the operating lever for the feed stopping and starting mechanism.

In operating the machine, an attendant or attendants stand at the forward edge of the platform and move the logs, which should come in down a lateral incline, onto the feed chains, taking care to see that they are at right angles to the chains, and another attendant standing at the operating levers watches the sawing operation and controls and regulates the feed to suit the condition of the logs presented to the saws.

Having thus described my invention, what I claim as new is—

1. In a machine for butting logs, the combination with the frame having the table and series of vertical guides above said table, of the gangs of vertical alternately arranged oppositely reciprocating saws having the upper ends independently guided in said guides, a drive shaft, eccentrics thereon and connections between the eccentrics and saws for reciprocating the same; substantially as described.

2. In a machine for butting logs, the combination with the frame having the table, the series of vertical guides above said table and a corresponding series of vertical guides below the table, of the gangs of alternately arranged oppositely reciprocating saws having their upper and lower ends independently guided in said guides, a drive shaft, eccentrics thereon and connections between the eccentrics and saws for reciprocating the latter; substantially as described.

3. In a machine for butting logs, the combination with the frame having the table, the series of vertical guides above said table and a corresponding series of vertical guides below the table, of the gangs of independent alternately arranged oppositely reciprocating saws having their upper and lower ends guided in said guides, a drive shaft below the saws, an eccentric for each saw located on said shaft and a connecting rod between each eccentric and its saw; substantially as described.

4. In a machine for butting logs, the combination with the table, gang of saws and feeding mechanism passing between the saws, of the series of independent movable pressers located between the saws and arranged one adjacent to and on each side of each saw whereby the block between each two adjacent saws is held independently of every other block; substantially as described.

5. In a machine for butting logs, the combination with the table, gangs of vertically reciprocating saws and feeding chains arranged to pass two between each two adjacent saws, of the series of independent movable pressers located in pairs between each two adjacent saws whereby each section of the log between the saws is held independently of every other section; substantially as described.

6. In a machine for butting logs, the combination with the table, gang of saws and the pairs of feeding chains passing between each two adjacent saws, of the independent presser rollers arranged between the saws and in vertical planes intermediate the feeding chains; substantially as described.

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