No. 721,680. PATENTED MAR. 3, 1903.

T. M. DUNAGAN, JR.

WOOD SAWING MACHINE.

APPLICATION FILED SEPT. 22, 1902.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.

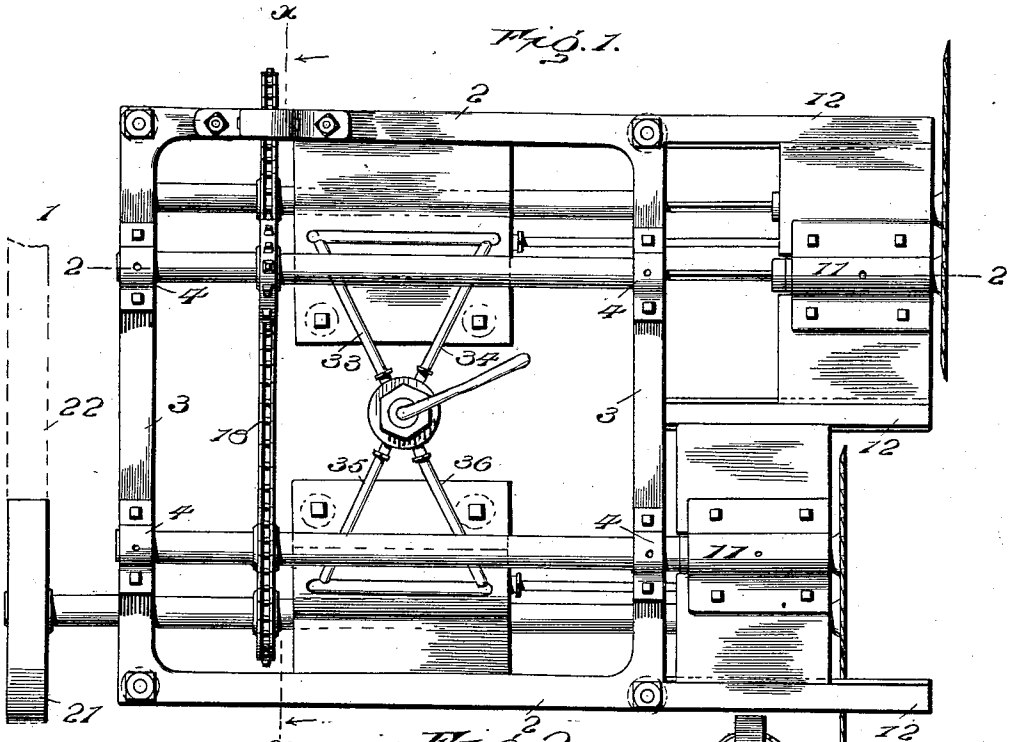
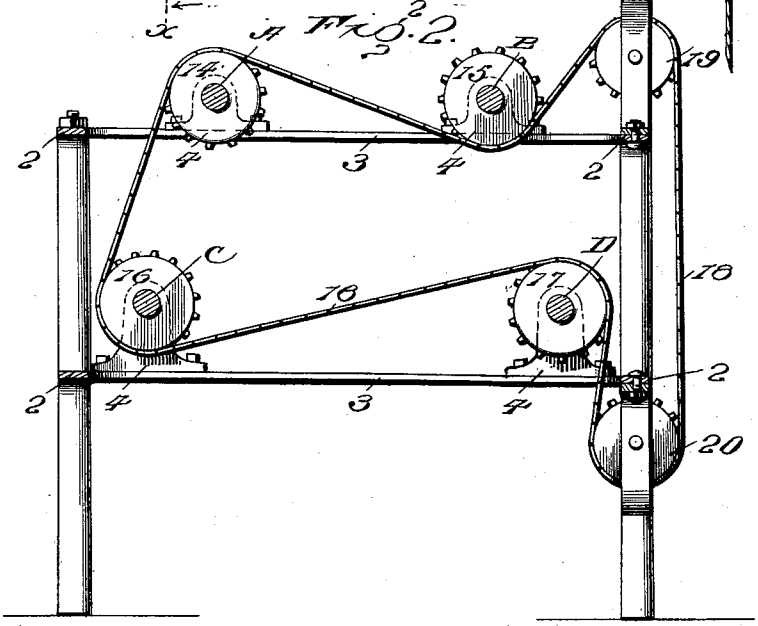


Fig. 2.



Witnesses

A. Franklin

W. A. Williams

Inventor

T. M. Dunagan, Jr.

By

R. S. & A. B. Lacey.

Attorneys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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NO MODEL. 2 SHEETS—SHEET 2.

Fig. 3.

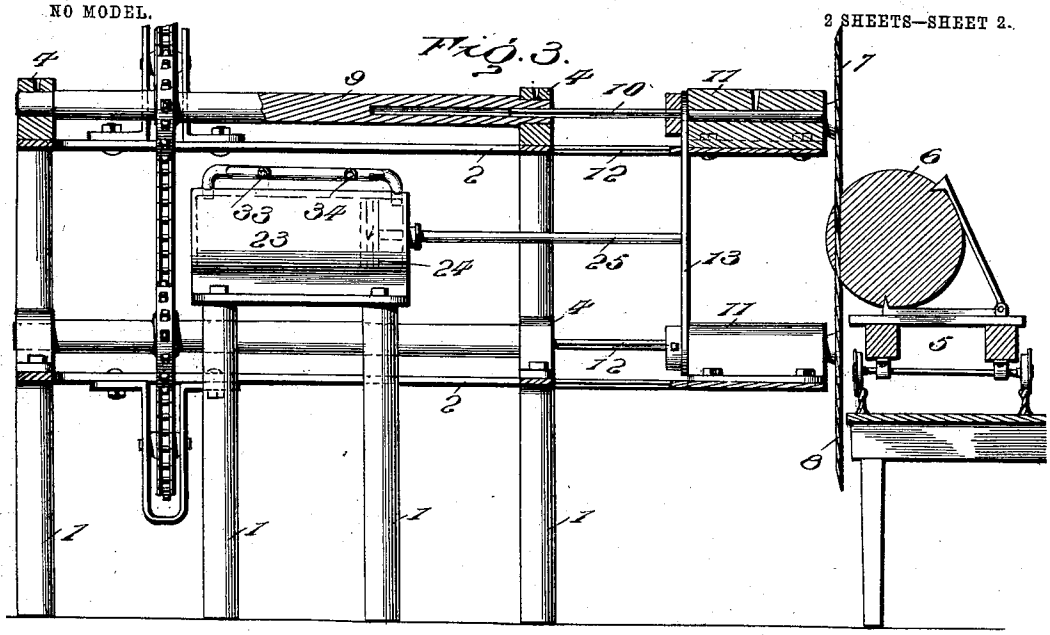


Fig. 4.

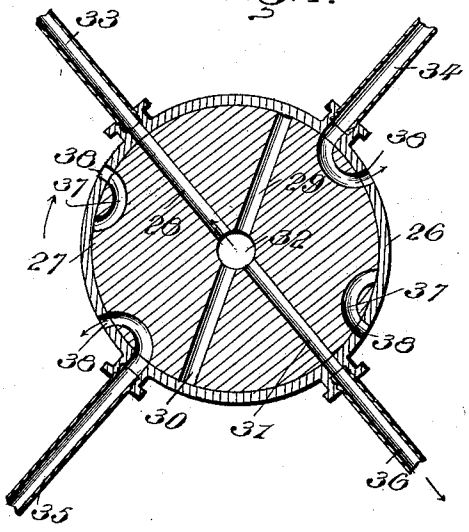


Fig. 5.

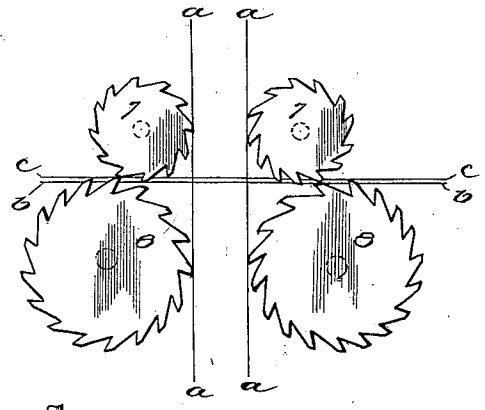
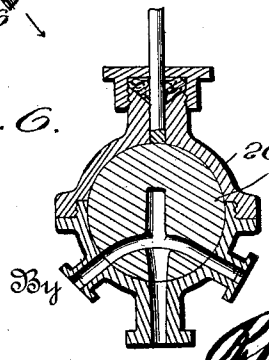


Fig. 6.



Witnesses
W. Franklin
M. A. Williams

Inventor
T. M. Dunagan, Jr.

By R. S. & A. B. Lacey. Attorneys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

THOMAS M. DUNAGAN, JR., OF NOBLE, OREGON.

WOOD-SAWING MACHINE.

SPECIFICATION forming part of Letters Patent No. 721,680, dated March 3, 1903.

Application filed September 22, 1902. Serial No. 124,447. (No model.)

To all whom it may concern:

Be it known that I, THOMAS M. DUNAGAN, Jr., a citizen of the United States, residing at Noble, in the county of Marion and State of Oregon, have invented certain new and useful Improvements in Wood-Sawing Machines, of which the following is a specification.

This invention has for its object to save time and increase the working capacity of machines designed for sawing logs into boards, rafters, or other longitudinal parts, the purpose being to devise a machine which will enable the log to be cut at each forward and backward travel of the carriage.

In accordance with this invention two sets of saws are provided and arranged to cut in opposite directions and means coöperate with the saws to alternately advance one and withdraw the other, so that the log is cut at each advance and return movement of the carriage.

For a full description of the invention and the merits thereof and also to acquire a knowledge of the details of construction of the means for effecting the result reference is to be had to the following description and drawings hereto attached.

While the essential and characteristic features of the invention are susceptible of modification, still the preferred embodiment of the invention is illustrated in the accompanying drawings, in which—

Figure 1 is a top plan view of a machine embodying the invention. Fig. 2 is a transverse section on the line X X of Fig. 1 looking in the direction of the arrows. Fig. 3 is a longitudinal section showing the relative position of the log and carriage. Fig. 4 is a sectional view of a four-way valve for controlling the fluid medium employed for reversing the saws. Fig. 5 is a detail view showing the relative arrangement of the saws. Fig. 6 is a section of the valve in a plane at a right angle to the sectional view of Fig. 4.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

The framework for supporting the operating parts may be of any suitable construction and comprises uprights 1, longitudinal beams 2, and cross-beams 3, the latter provided with bearings 4, in which the saw mandrels or arbors are journaled. The carriage 5 for carrying the log 6 to be cut into planks, rafters, and the like may be of any construction commonly employed in woodworking machinery of this class, said carriage being adapted to be run backward and forward the length of the log, so as to feed the work to the saws.

In accordance with this invention two sets of saws are provided and arranged to cut in opposite directions and mounted to admit of one set being thrown into working position simultaneously with the throwing of the other set out of action. This operation takes place at the end of the travel of the carriage 5 in each direction, so that on the return travel of the carriage the saw previously inactive operates upon the log and the saw previously cutting is thrown out of action. The saws or cutters may be of any type commonly employed for cutting logs into planks, joists, or other parts. As shown, each set of saws is composed of upper and lower circular saws, the upper saw 7 being smaller or of less diameter than the lower saw 8 and both saws 7 and 8 being arranged with their cutting edges in a perpendicular line, as indicated at *a a* in Fig. 5. The points of the teeth of the saws 7 touch a horizontal line indicated at *b b* in Fig. 5, whereas the points of the teeth of the saws 8 touch a horizontal line indicated at *c c* in Fig. 5, the line *b b* being below the line *c c*. The cutting edges of the upper and lower saws overlap, this being necessary in order to provide a clean and through cut of the timber. By having the saws 7 of less diameter than the saws 8 and set forward thereof the cutting edges are adapted to overlap in the manner and for the purpose stated.

The saw mandrels or arbors are indicated at A, B, C, and D and are of similar construction, each being composed of slidable or telescopic parts so related as to admit of driving the saws and at the same time permitting of one set of saws being advanced and the other set retracted. Each saw-mandrel is composed of the parts 9 and 10, the part 9 being journaled in the bearings 4 and the part 10 being arranged to telescope with the part 9 and having the respective circular saw secured to its outer end in any well-known manner. The part 9 is tubular and the part 10 is angular or otherwise constructed, so

as to rotate with the part 9 while free to slide rectilinearly with reference thereto. Each part 10 is rotatably mounted at its outer end in a cross-head 11, mounted in ways or guides 12. The cross-heads corresponding to the saws of each set are connected, by means of a gland or yoke 13, for simultaneous movement, so as to insure a like and synchronous movement of the saws 7 and 8, which is essential to the proper working of the machine. Any means may be employed to effect a shifting of the saws, so as to throw one set into operative position and the other set out of action, and for convenience the instrumentalities illustrated have been employed and will be described in detail hereinafter. The respective saw-mandrels are provided with drivers 14, 15, 16, and 17, which in the present instance are preferably sprocket-wheels, with which a sprocket-chain 18 coöperates, said sprocket-chain passing over the driver 14, beneath the driver 15, over the driver 17, and beneath the driver 16, whereby the mandrels corresponding to the saws of each set are driven in reverse directions, this being essential to prevent the saws from advancing the work too rapidly or in acting in opposition to the feed, the action of one saw upon the timber being neutralized by the companion saw of the same set. The sprocket-chain 18 passes over an idler 19 and beneath a corresponding idler 20 and receives motion from one of the mandrels which is extended and provided with a band-pulley 21, to which power is applied from any suitable engine or motor by means of a drive-belt 22 in the accustomed way.

As hereinbefore intimated, any mechanical means may be employed for simultaneous operation of the saws, so as to project one set into working position and withdraw the other set out of the way of the plank, slab, or beam being cut from the log. The means illustrated embody a cylinder 23, a piston 24, arranged to operate in the cylinder and having its stem 25 connected to the gland or yoke 13, and a valve mechanism for controlling the admission of the motive medium to the cylinders and the exhausting of the same therefrom when its force has been expended. The valve mechanism may be of any type or construction so long as it will admit of the motive medium being utilized so as to reciprocate the respective pistons within their operating-cylinders, the ports being arranged to cause the pistons to synchronously travel in reverse directions, whereby the saws are simultaneously actuated, the one being projected while the other is at the same time retracted. The valve illustrated is of the four-way variety and comprises a casing 26 and a valve-body 27, the latter being formed with passages 28, 29, 30, and 31, intersecting at a common point, as at 32, and adapted to register with pipes 33, 34, 35, and 36, which have connection at opposite ends of the respective cylinders. Curved passages 37 are formed in the valve-body 27 and serve to exhaust the spent motive medium from the cylinders, said passages being adapted to register with openings 38 in the casing 26. The valve mechanism shown may be substituted by any mechanism of selected type which will admit of alternately admitting the motive medium into opposite ends of the respective cylinders opposite to that receiving the live agent.

A machine of the character set forth embodying the invention admits of a slab, plank, or section being cut from a log at each travel of the carriage, the cutting mechanism in operation at one travel of the carriage being thrown out of operative position and the other cutting mechanism being thrown into position to operate upon the log upon the return movement or travel of the carriage, thereby saving time and about doubling the output of a machine of given capacity.

Having thus described the invention, what is claimed as new is—

1. In a sawing-machine of the character described, two sets of cutter mechanisms, each comprising a pair of saws, mandrels comprising telescopic sections, one of the sections of each mandrel being mounted for rotation only and the other slidably mounted in the aforesaid section and adapted to be rotated thereby, yoke connections between the slidable sections of the respective mandrels of each set of saws, whereby same are adapted for simultaneous reciprocation in reverse directions, means for imparting rotary movement to the non-reciprocating sections of the mandrels consisting of sprocket-wheels rigidly secured to said sections, upper and lower idlers, and a sprocket-chain passing over the sprocket-wheel of the upper mandrel-section of one set of saws under the corresponding wheel of the upper section of the other set, over the upper and under the lower idlers and over and under the lower sprocket-wheels of the lower mandrel-sections, respectively, whereby the mandrels corresponding to the saws of each set are driven in reverse directions, power being applied to one of the mandrels in any suitable manner, substantially as described.

2. In a machine of the character described, two pairs of circular saws, telescopic mandrels therefor, slidably-mounted cross-heads constituting bearings for the sections of the mandrels carrying the saws, yokes connecting corresponding cross-heads, means for imparting rotary movement to the saw-mandrel sections mounted for rotation only, and actuating mechanism for simultaneously reciprocating the yokes in reverse directions, substantially as and for the purpose specified.

In testimony whereof I affix my signature in presence of two witnesses.

THOMAS M. DUNAGAN, JR. [L. S.]

Witnesses:
J. W. HOBART,
GEO. A. COLEMAN.