

(No Model.)

2 Sheets—Sheet 1.

J. H. KOEHLER.  
SAWING MACHINE.

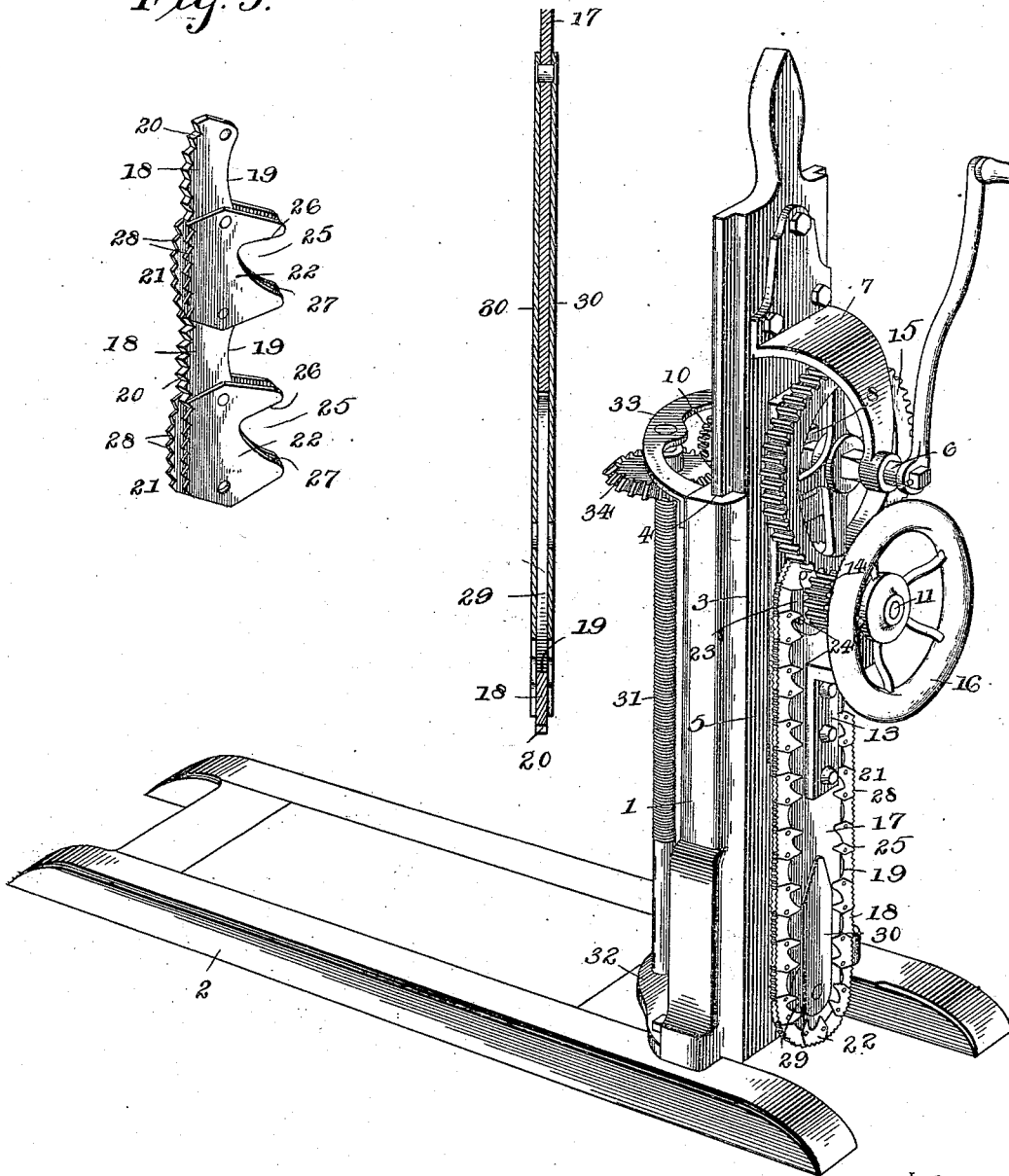
No. 553,286.

Patented Jan. 21, 1896.

*Fig. 6.*

*Fig. 1.*

*Fig. 5.*



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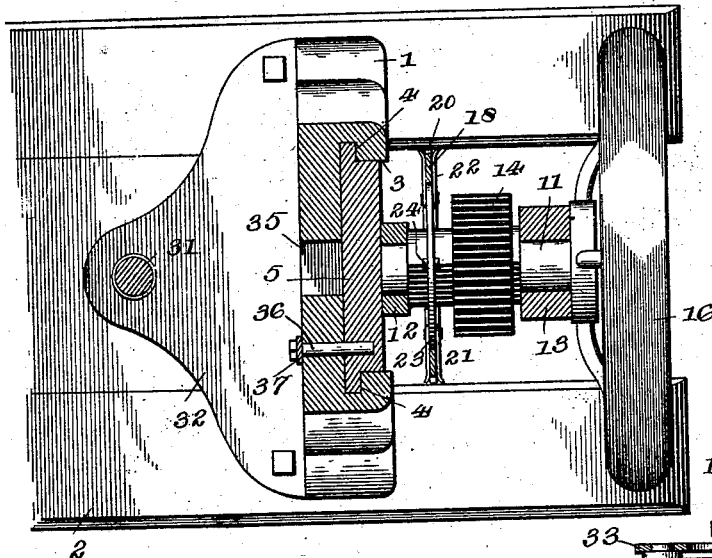
2 Sheets—Sheet 2.

No. 553,286.

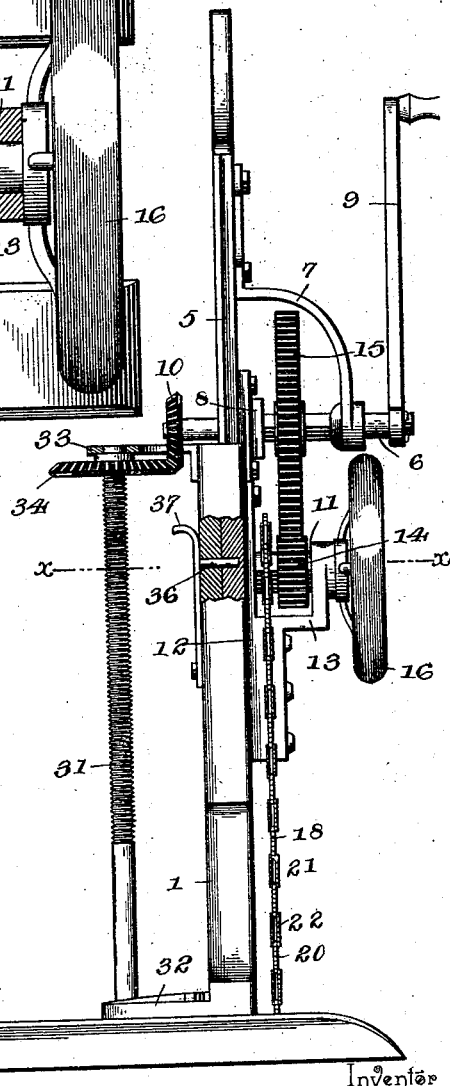
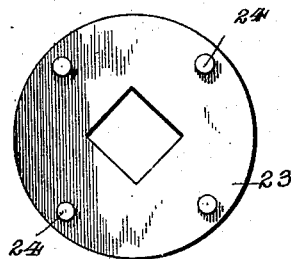
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*Fig. 3.*

*Fig. 2.*



*Fig. 4.*



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# UNITED STATES PATENT OFFICE.

JOHN H. KOEHLER, OF IONA, PENNSYLVANIA.

## SAWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 553,286, dated January 21, 1896.

Application filed May 23, 1895. Serial No. 550,404. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN H. KOEHLER, a citizen of the United States, residing at Iona, in the county of Lebanon and State of Pennsylvania, have invented a new and useful Sawing-Machine, of which the following is a specification.

This invention relates to sawing-machines which embody in their organization an endless-chain or band-saw cutter and which is designed for mortising and cutting openings or slots through boards and timbers; and the object of the invention is the provision of a simple mechanism easy of manipulation, efficient in use, and capable of performing the desired work in a rapid and satisfactory manner.

With these and other objects in view the improvement consists of the novel features and the peculiar construction and combination of the parts, which hereinafter will be more fully described and claimed and which are shown in the accompanying drawings, in which—

Figure 1 is a perspective view of the improved machine. Fig. 2 is a side elevation thereof, a portion of the standard being broken away, showing the operation of the spring-actuated catch for holding the movable plate or carriage at its highest position. Fig. 3 is a plan section on the line XX of Fig. 2. Fig. 4 is a detail view of the drive-pulley for actuating the endless saw. Fig. 5 is a detail view of a portion of the endless saw on a larger scale. Fig. 6 is a detail view, in section, of the lower portion of the saw-guide, showing it provided with a pulley which supports the lower portion of the endless saw.

The standard 1 rises vertically from the base 2 and is recessed in its front side, as shown at 3, and the walls of the recess have vertical grooves 4, which form guideways in which operate the flanged edge portions of the plate or carriage 5, which carries the saw and its actuating mechanism. A drive-shaft 6 is journaled in the plate or carriage 5 and is supported near its outer end by means of a bracket 7 and about midway of its ends by a bearing-block 8, which is bolted or otherwise firmly attached to the carriage 5. The outer end of the drive-shaft 6 is made angular or otherwise constructed so as to receive a crank 9, by means of which the shaft 6 is operated by

manual power when the machine is in efficient service, and the inner or rear end of the shaft 6 extends beyond the rear side of the standard 1 and has a bevel-pinion 10 keyed thereto and by means of which the positive feed of the saw is controlled, as will be described more fully hereinafter. A short shaft 11 is disposed parallel with the drive-shaft 6 and is journaled at its inner end in a bar or block 12 made fast to the carriage 5 and near its outer end in a bracket 13 secured to the bar or block 12, and a pinion 14, mounted upon the shaft 11, meshes with a gear-wheel 15 provided on the drive-shaft 6, and by means of which motion is transmitted from the shaft 6 to the shaft 11. A fly or balance wheel 16 is keyed upon the outer end of the shaft 11 and is adapted to steady the movement of the machine, as will be readily appreciated.

A guide 17 is secured near its upper end to the carriage 5 in any convenient manner, and as shown this guide is formed of a plate which is clamped between the bar 12 and the bracket 13, and this guide extends a proper distance below the lower end of the carriage 5 so as to enter a mortise, slot or kerf cut into the board or timber by the machine when in operation.

The endless cutter or band-saw is constructed after the fashion of a chain, being composed of a series of links which are pivotally connected together at their contiguous ends. The intermediate links 18 are constructed alike and are formed of plates which are oblong in side elevation and which have their rear edges 19 curved on the arc of a circle corresponding to the curved ends of the guide 17, around which the said endless cutter travels, and the front edge of these plates is formed with a series of teeth 20, by means of which the cutting is effected. The alternate links 21 comprise similar side plates 22, between which the links 18 are located and have pivotal connection in any convenient and approved manner common in the art of connecting endless-chain links. The side plates 22 are comparatively thin and are considerably wider than the links 18, the rear portions embracing the sides of the guide 17, so as to cause the endless saw to travel in a plane corresponding with the plane of the guide 17. The drive-pulley 23, mounted upon

the shaft 11 so as to revolve therewith, has its peripheral edge portion corresponding in thickness to the thickness of the guide 17 so as to fit snugly between the side plates 22 of the alternate links 21, and this drive-pulley is provided near its edge with laterally-extending pins 24 properly positioned so as to engage with notches 25 formed in the rear edges of the side plates 22, and by means of which the endless saw or band cutter is positively rotated in the operation of the machine. The notches 25 have one wall, 26, straight and the opposite wall, 27, curved, whereby the pins 24 are adapted to readily enter the notches 25 and leave the same without retarding in the slightest degree the forward travel of the endless saw. The side plates 22 have saw-teeth 28 which correspond with the saw-teeth 20 of the links 18, and these teeth 28 are bent outwardly, so that in the operation of the machine the kerf formed by the endless saw will be wider than the thickness of the guide 17 and the endless saw, so that the latter will operate freely within the kerf without any binding against the walls thereof. The teeth 20 of the links 18 are filed square across and serve to remove the sawdust from the kerf and dislodge that part of the wood comprised between the cuts made by the teeth 28 of the side plates 22, as will be readily understood.

The lower end of the guide 17 may be rounded to conform to a half of the drive-pulley 23, so as to facilitate the passage of the endless saw thereover. While this construction will give good results, it is preferred to locate a pulley 29, of similar diameter to the drive-pulley 23, at the lower end of the guide 17, and this pulley 29 corresponds in thickness to the thickness of the guide 17 and is journaled in side plates 30 firmly attached at their upper ends to the sides of the guide 17, and these side plates 30 are extremely thin, being of a thickness corresponding to the gage of the side plates 22 of the alternate links 21, so as not to bind against the walls of the kerf formed by the endless saw. The ends of the guide 17 adjacent to the pulleys 23 and 29 are convexed to conform to the respective pulleys, so as to preclude the formation of any space between the extremities of the guide 17 and the respective pulleys, which would be likely to collect sawdust and foreign matter and choke or impede the free movements of the endless saw, and which would likely result in the catching of the links upon the edges of the guide or pulleys when passing from the one to the other.

A feed-controlling screw 31 is located immediately in the rear of the standard 1, and is supported at its lower end in the foot 32 of the said standard and at its upper end in a bracket 33 extending horizontally from the upper portion of the said standard. A bevel gear-wheel 34 is internally threaded and mounted upon the screw 31, and is adapted to mesh with the bevel-pinion 10, so as to con-

trol the feed of the saw and prevent the latter from taking too large a bite when the machine is performing work. It must be remembered that the carriage 5 supports the endless saw and its actuating mechanism. Consequently it is comparatively weighty and if not restrained will cause the saw to bite into the wood in such a manner as to render the operation of the machine extremely difficult if at all possible. Hence by providing the screw 31 and the bevel-gearing 34 and 10 this downward tendency of the carriage 5 is controlled and the saw fed or advanced gradually to the work. The standard 1 is formed with a vertical slot 35 for the passage of the rear end of the drive-shaft 6, and is supplied with a spring-actuated catch 36, which is adapted to engage with the carriage 5 and support the latter at its highest position, as shown most clearly in Fig. 2.

The machine is susceptible of various uses, and when constructed substantially as herein set forth is particularly adapted for cutting mortises, slots or grooves in boards or timbers, and when used for any of these purposes it is placed with its base 2 resting upon the board or timber to be operated upon, and the spring-actuated catch 36 is disengaged from the carriage 5 and the crank 9 operated in the usual manner, when the carriage will descend slowly, being governed in its movements by the feed-controlling mechanism, and after the required depth of cut has been attained the carriage is lifted, being provided at its upper end with a handle 37 to facilitate the grasping of the same when it is required to lift the carriage from its lowest position. When the carriage reaches its elevated position, the spring-actuated catch 36 will engage and retain it in the elevated position until the machine is adjusted for making a new cut, when the operation just described will be repeated.

As previously intimated, the machine is adapted for purposes other than those herein mentioned. Hence in adapting the same for the particular use it is to be understood that various changes in the form, proportion, and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention.

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

1. In a sawing machine, the combination with a vertically-disposed standard and a carriage vertically movable thereon and provided with the cutting and actuating mechanism, of provisions to regulate the descent of the carriage and control the feed of the cutter, consisting of a vertically-disposed screw located opposite to and extending in parallelism with the standard, and gearing between the actuating mechanism of the cutter and the said screw, held in engagement by the weight of the carriage and separable to per-

mit of the upward movement of the carriage at any time, substantially as set forth for the purpose described.

2. In a sawing machine, the combination of  
5 a vertically-disposed standard, a vertically-movable carriage supporting the cutter and the cutter-actuating mechanism, a vertically-disposed screw fixedly mounted opposite to and parallel with the standard, an internally-threaded gear wheel mounted upon the said  
10 screw, and a gear driven by the cutter-actuating mechanism and extending across the path of the internally-threaded gear wheel to mesh with the latter and held in meshing relation therewith by the weight of the carriage  
15 and the attached parts to control the feed of the carriage and said gears being separable to admit of the upward movement of the carriage at any time, substantially as and for  
20 the purpose specified.

3. The herein-described sawing machine, comprising a base, a standard rising vertically therefrom and provided in its front side with a vertical recess, and having vertical grooves  
25 in the walls of the said recess, a carriage operating in the said recess and provided with edge flanges to work in the said vertical grooves, a drive shaft journaled in suitable bearings provided on the carriage and having  
30 a gear wheel and a bevel pinion, a second

shaft having a pinion meshing with the gear wheel of the drive shaft, and having a balance wheel, a guide firmly attached to the carriage and provided at its lower end with a pulley, a drive pulley mounted upon the second  
35 shaft and having lateral extensions, an endless saw or band cutter comprising links which have rearwardly-extending portions embracing the sides of the edge portions of the guide and pulleys, and which have notches in their  
40 rear edges to receive the lateral extensions of the pulley, one wall of the notches being straight and the opposite wall curved, a vertically-disposed feed-controlling screw, parallel with and located in the rear of the standard,  
45 and a bevel gear wheel internally threaded and mounted upon the said feed screw and adapted to mesh with the bevel pinion of the drive shaft, and held in meshing relation  
50 therewith by means of the weight of the carriage and the attached parts, substantially as described for the purpose set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

JOHN H. KOEHLER.

Witnesses:

W. F. KLEIN,

GEO. W. KREIDER.