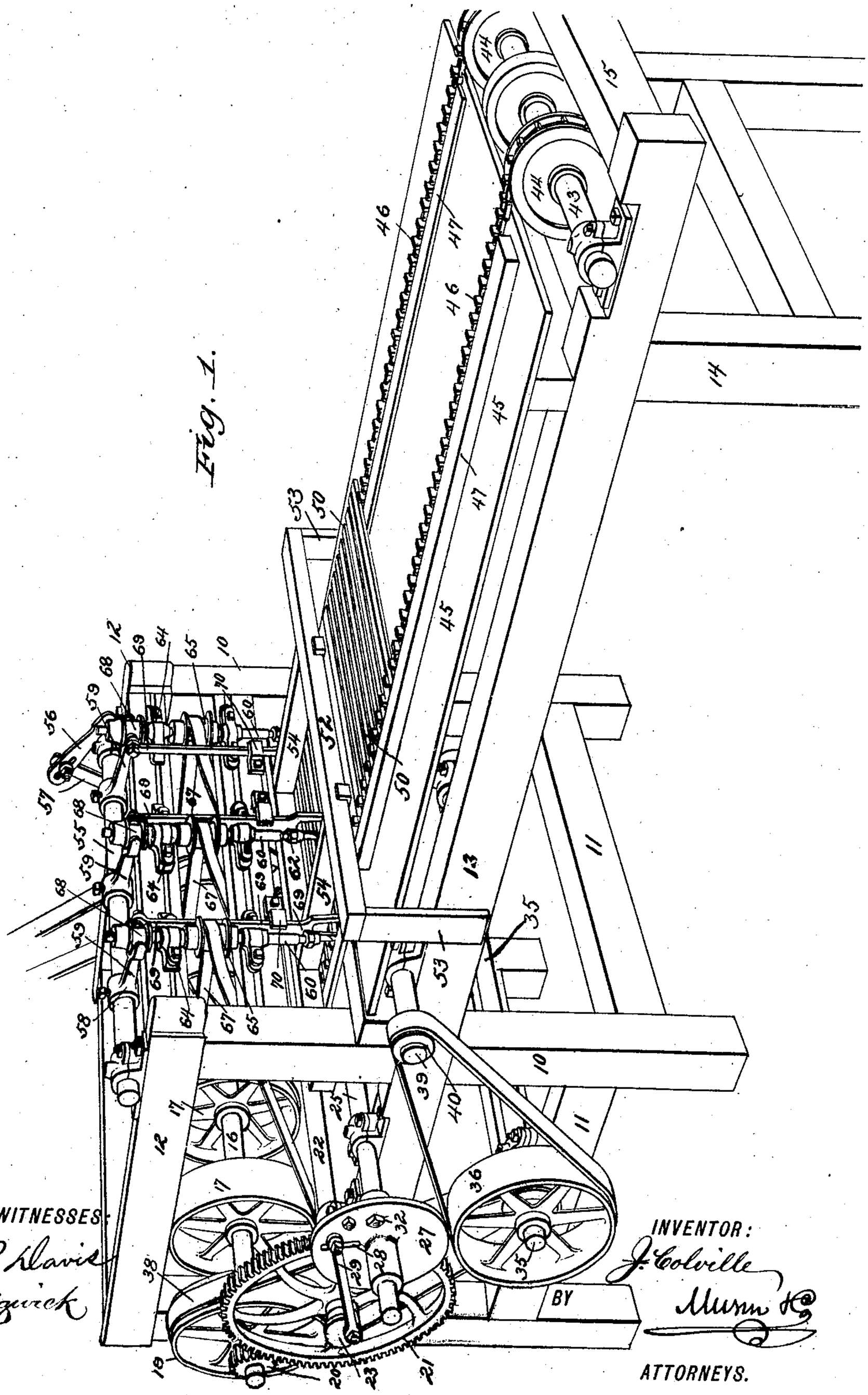
(No Model.) 6 Sheets—Sheet 1.

J. COLVILLE.

MACHINE FOR BORING AND TRIMMING SLATS.

No. 410,784. Patented Sept. 10, 1889.

Fig. 1.



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(No Model.) 6 Sheets—Sheet 2.

J. COLVILLE.

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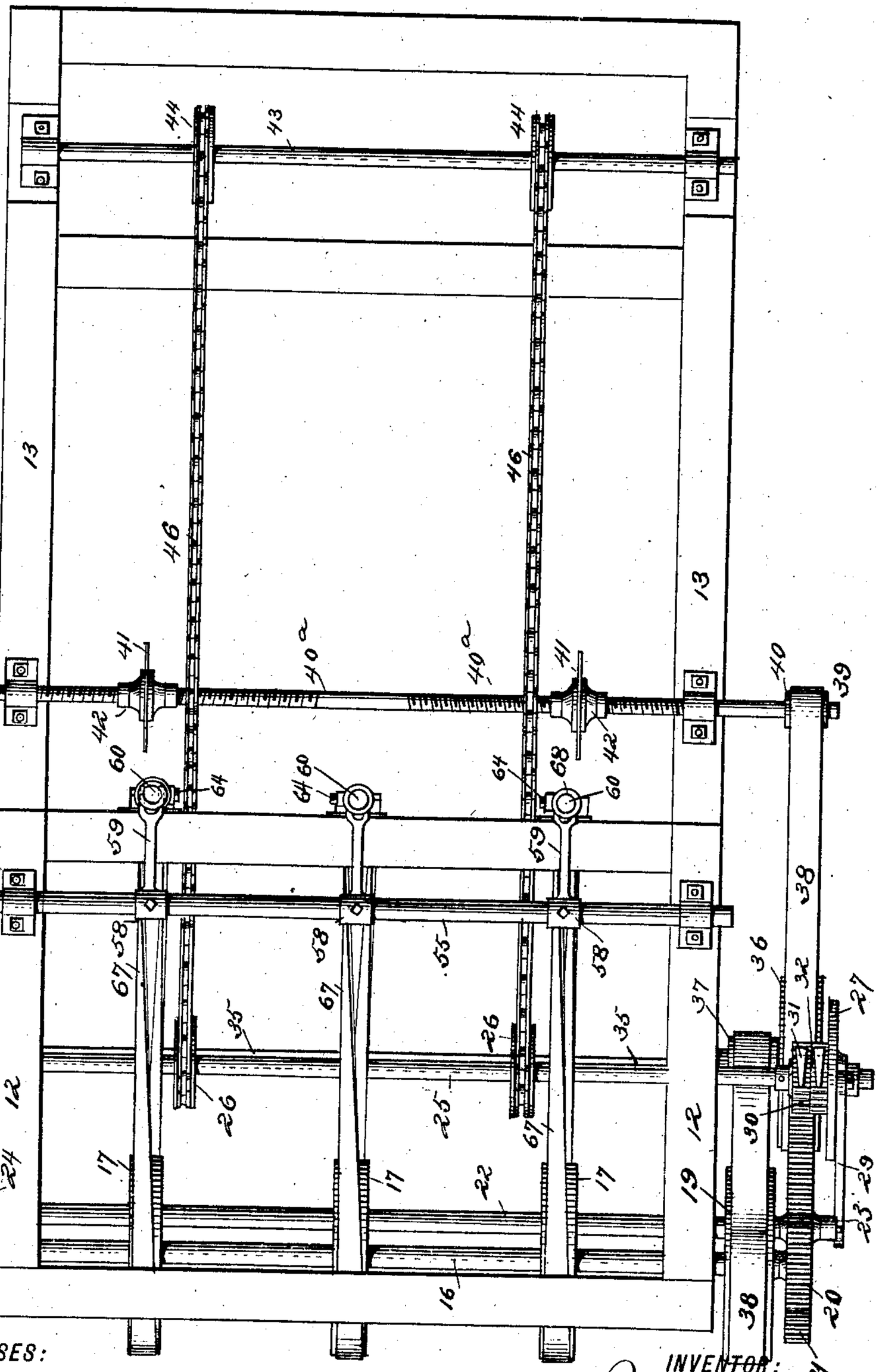
Fig. 2.



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(No Model.)

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J. COLVILLE.

MACHINE FOR BORING AND TRIMMING SLATS.

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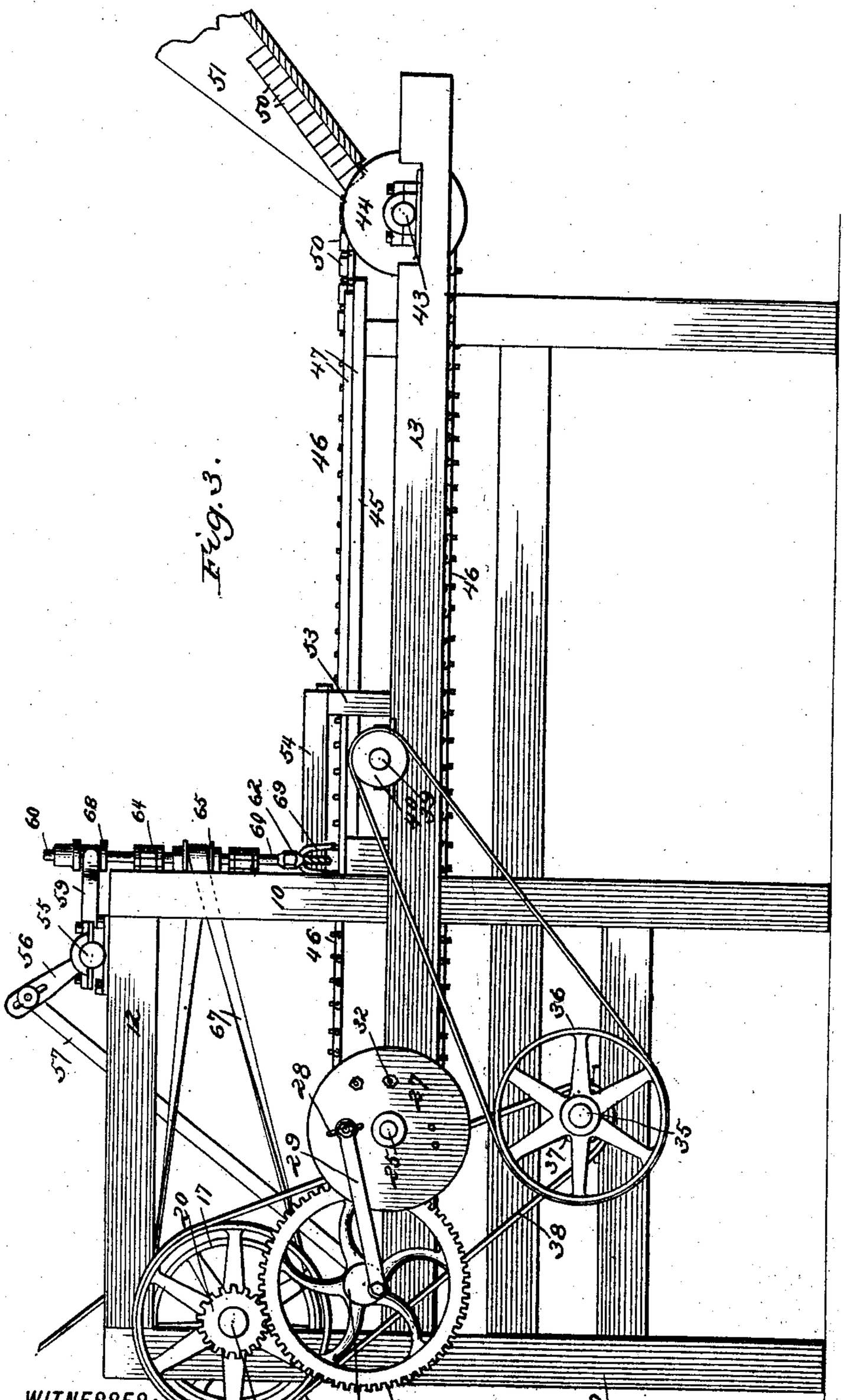
Fig. 3.



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6 Sheets—Sheet 4.

J. COLVILLE.

MACHINE FOR BORING AND TRIMMING SLATS.

No. 410,784. Patented Sept. 10, 1889.

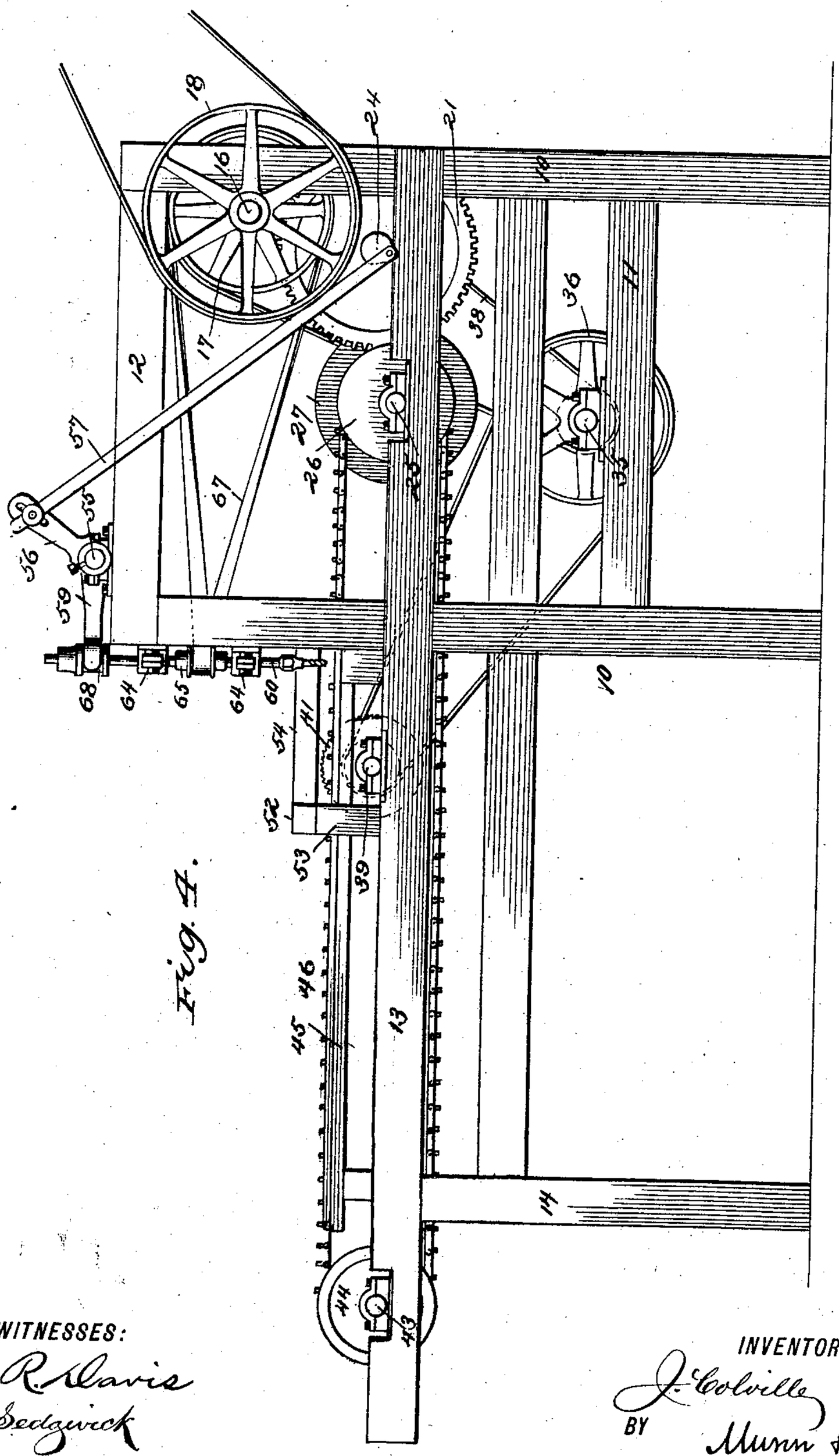

Fig. 4.

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J. COLVILLE.

MACHINE FOR BORING AND TRIMMING SLATS.

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Fig 5.

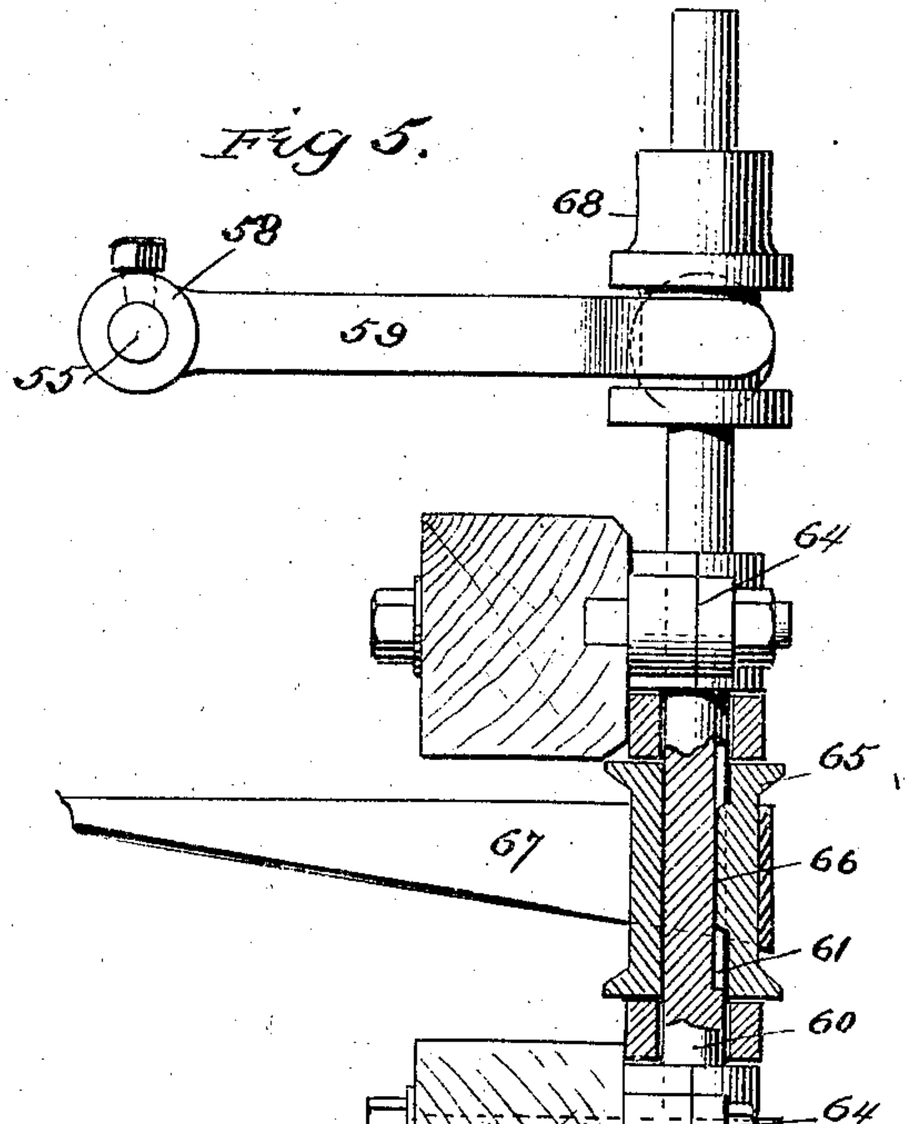


Fig. 8.

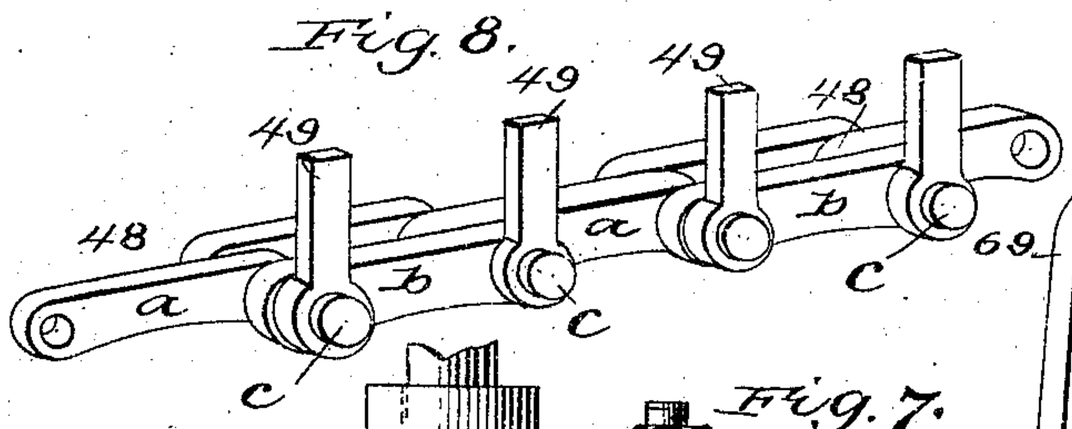


Fig. 7.

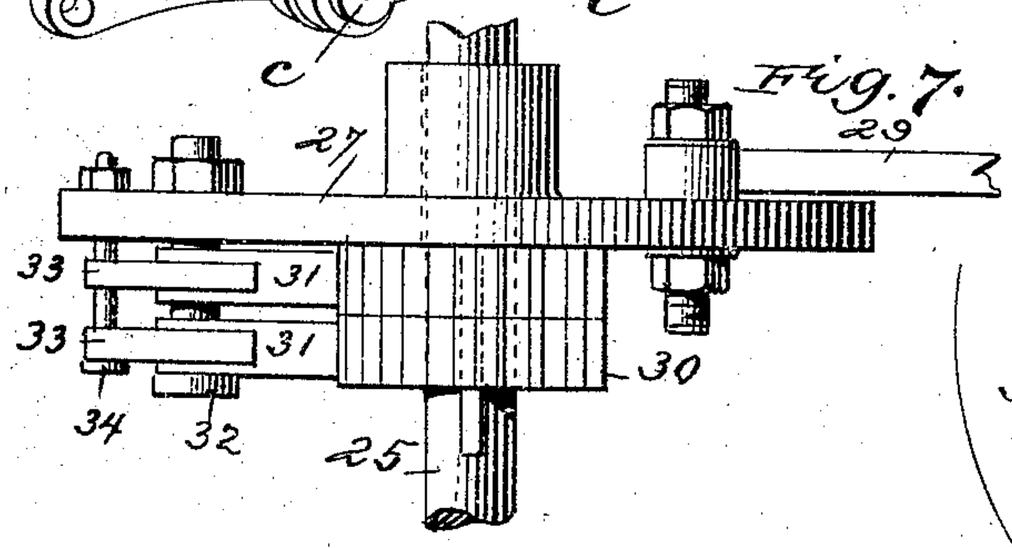
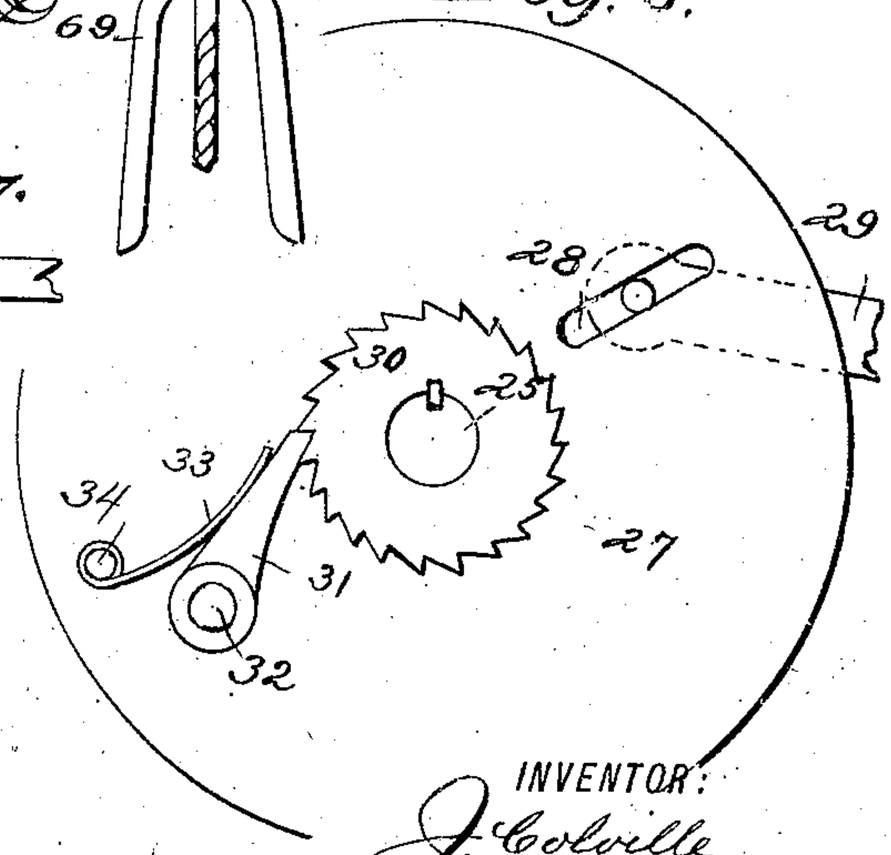


Fig. 6.



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J. COLVILLE.

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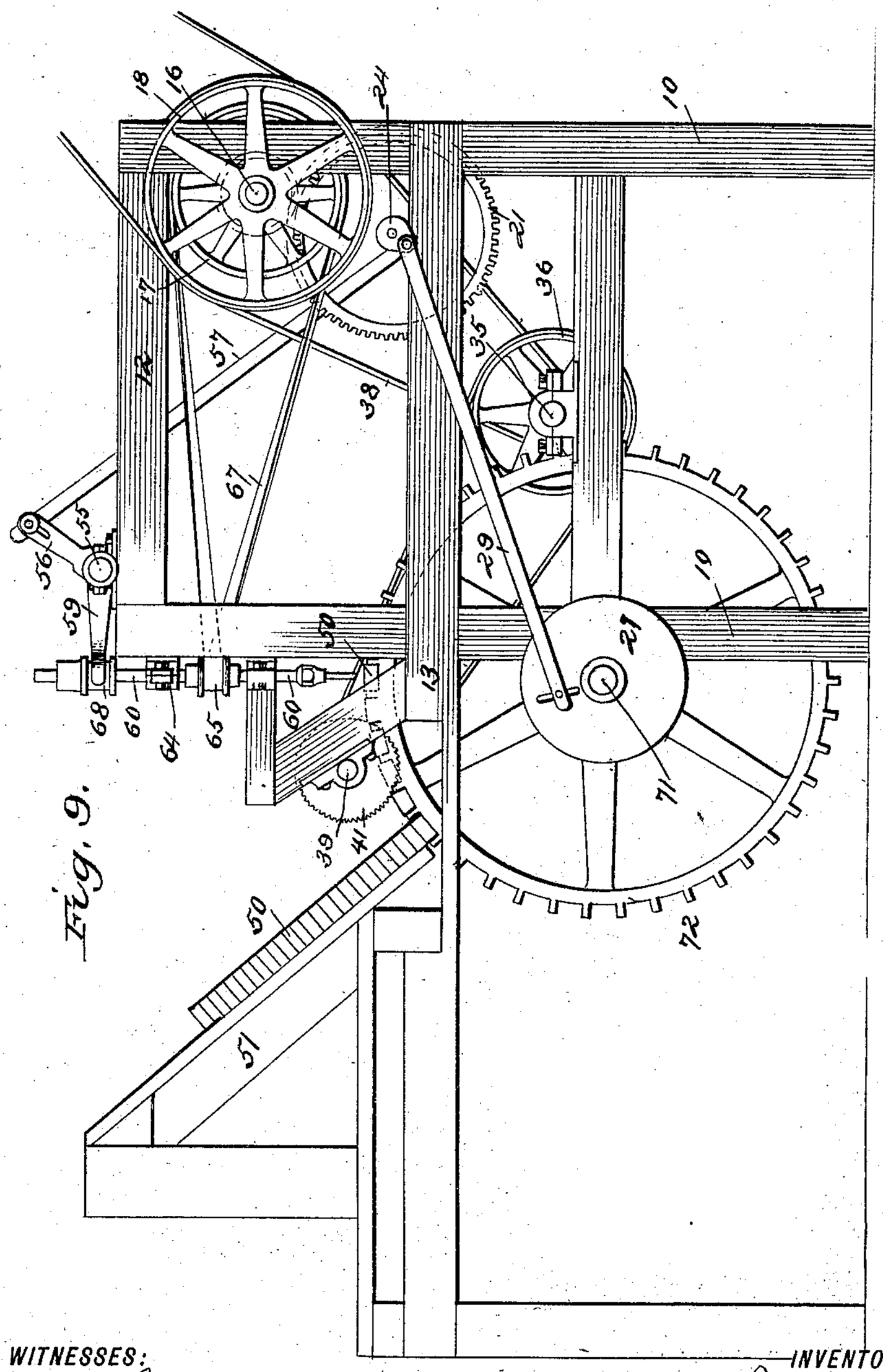

Fig. 9.

WITNESSES:
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INVENTOR:
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UNITED STATES PATENT OFFICE.

JOHN COLVILLE, OF BRUNSWICK, GEORGIA.

MACHINE FOR BORING AND TRIMMING SLATS.

SPECIFICATION forming part of Letters Patent No. 410,784, dated September 10, 1889.

Application filed December 31, 1888. Serial No. 295,006. (No model.)

To all whom it may concern:

Be it known that I, JOHN COLVILLE, of Brunswick, in the county of Glynn and State of Georgia, have invented certain new and useful Improvements in Boring and Cross-Cutting Machines, of which the following is a full, clear, and exact description.

My invention relates to a machine for boring or drilling and cross-cutting, and has for its object to provide a machine of simple and durable construction capable of receiving a number of slats and automatically delivering the same to a series of drills or bits and a series of saws.

A further object of the invention is to provide a machine for treating the slats used in the construction of a crate patented to myself on the 30th day of March, 1886, No. 339,045.

The invention consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth, and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters and figures of reference indicate corresponding parts in all the views.

Figure 1 is a perspective view of the machine. Fig. 2 is a plan view of the same. Figs. 3 and 4 are side elevations. Fig. 5 is a side elevation of the bit-stock, the same being partially in section. Fig. 6 is a side elevation of the ratchet-disk. Fig. 7 is a plan view of the same, illustrating its attachment to the shaft. Fig. 8 is a perspective detail view of a section of the carrying-chain; and Fig. 9 is a side elevation of the machine, illustrating the application thereto of a modified form of carrier.

The body or frame of the machine is preferably made rectangular, consisting of four corner-posts 10, connected at or near the base by a series of cross-bars 11 and at the top by a series of similar cross-bars 12. A beam 13 is attached in any approved manner to each side of the body-frame at the center of the same, which beams 13 are projected horizontally outward from the body, and are supported at their outer ends by suitable legs 14, and the outer extremities of the said side beams 13 are connected by a cross-bar 15.

Upon the rear corner-posts 10 of the body near the top a transverse driving-shaft 16 is journaled, provided with three or more pulleys 17, secured thereto within the body-frame, a driving-pulley 18 at one outer end, and a second driving-pulley 19 at the opposite end, as best shown in Figs. 1, 2, and 4.

The end of the shaft 16, carrying the pulley 19, is provided with a pinion 20, meshing with a spur-wheel 21, rigidly secured to a second transverse shaft 22, journaled upon the side beams 13 within the body-frame, slightly in advance of the driving-shaft 16, the two shafts 22 and 16 being parallel. At each extremity of the shaft 22 a crank-disk 23 and 24 is respectively secured. The spur-wheel 21 is attached to the shaft 22 contiguous to the crank-disk 23 and outside of the body-frame, as best illustrated in Fig. 1.

A second transverse shaft 25 is journaled within the body-frame upon the side beams 13, which shaft, within the frame, is provided with two rigidly-attached spaced chain pulleys or wheels 26, as best illustrated in Fig. 2. Upon one outer extremity of the said shaft 25 a disk 27 is loosely mounted, provided with a diametrical slot 28. The disk 27 is connected with and is driven from the disk 23 on the shaft 22 by means of the pitman 29, pivoted at one end to said disk 23, the other end being adjustably secured to the disk 27 by means of a bolt and lock-nut, the said bolt being made to pass through the slot 28 of the said disk, as best illustrated in Figs. 1 and 3.

One or two ratchet-wheels 30 are keyed or otherwise secured upon the shaft 25 adjacent to the inner face of the disk 27, as illustrated in Fig. 7, which ratchet-wheels are engaged by pawls 31 or dogs pivoted upon a stud 32, projected from the inner face of the disk, the said dogs being held in contact with the said ratchet-wheels by the springs 33, having a bearing upon the upper face of the dogs, which springs are secured to the posts 34, also projected from the inner face of the disk above and essentially parallel with the stud 32, as best illustrated in Figs. 6 and 7.

Another transverse shaft 35 is journaled

upon the lower cross-bars of the body-frame, provided at one outer end with a driving-pulley 36 and a smaller pulley 37, adjacent to the driving-pulley, the latter pulley 37 being connected by a belt 38 with the pulley 19 upon the driving-shaft 16, as best shown in Figs. 1 and 2. By this means the lower shaft 35 is driven directly from the main driving-shaft. The shaft 35 is in turn adapted to drive a shaft 39, journaled upon the side beams 13 in front of the body-frame, as illustrated in Fig. 2, the same being effected by belting the pulley 36 to a pulley 40 on the shaft 39. The shaft 39 is provided with a thread 40^a, produced thereon between the side beams 13, and the said shaft 39 is adapted to carry two or more saws 41, clamped between two collars 42, which collars are adjustable upon the threaded surface of the shaft and held by suitable nuts.

At the forward end of the wing or bed of the machine formed by the supported side beams 13 a shaft 43 is journaled, carrying spaced chain wheels or pulleys 44, the spacing of the pulleys 44 upon the shaft 43 being made to correspond with the spacing of the similar pulleys 26 upon the shaft 25.

The wing or bed of the machine is preferably provided with a platform 45, elevated slightly above the side beams 13, which platform extends from a point adjacent to and to the rear of the forward chain pulleys or wheels 44 close to the body of the machine and over the saw-shaft 39.

Endless chain belts 46 are made to pass over the aligning chain-pulleys 44 and 26, the said chains being adapted to travel above and below the platform 45, being guided in their travel by guide-strips 47, attached to and extending longitudinally of the platform 45, as best illustrated in Fig. 1, the guide-strip to the right being adapted to engage with the inner face of the endless chain 46 at the right, and the guide-strip at the left being so located as to be in contact with the outer surface of the left-hand endless chain. The endless chain belts or carriers 46 consist of a series of pivotally-united solid links 48, as best shown in Fig. 8, so constructed that a single link *a* will alternate with two parallel spaced links *b*, the extremities of the single links being held between the spaced or parallel links by a suitable pivot *c*. A finger 49 is attached to each pivot *c* at the outer end, which fingers are adapted to project rigidly upward beyond the links, as shown in Fig. 8. In the completed chain or carrier the several fingers are located upon the outer side. These fingers 49 are adapted to retain and space the slats 50 to be treated horizontally across the table or platform of the wing or extension of the machine, as best illustrated in Fig. 1, the said strips or slats being fed to the carrier by means of a chute 51, located at the front of the machine immediately above the shaft 43, as best shown in Fig. 3, the said chute being of a width to just accommodate the slats, which slats are laid horizontally upon the bottom of the chute, one bearing against the other as the carrier or chain is revolved, and as the several pins rise upon the chain-wheel 45 a slat automatically drops into the spaces between the fingers by reason of the chute having an upward inclination. The slats are thus carried automatically over the platform 45 to the main frame of the machine, to be treated in a manner to be hereinafter set forth.

The slats are prevented from buckling up or rising from their proper position by means of a guide-arm 52, located adjacent to the main frame and projected transversely above the platform 45, the ends of which guide are supported upon suitable standards 53, rigidly attached to the outer face of the side beams 13. Auxiliary guide-arms 54 are provided, extending longitudinally above the platform, the rear ends of which longitudinal guide-arms are secured to the main frame of the machine in any suitable manner, the forward ends being attached to the transverse guide-arm 52, as fully illustrated in Fig. 1.

Upon the upper portion of the main frame at the front a rock-shaft 55 is journaled in any approved manner, the said rock-shaft having attached at one extremity an upwardly and rearwardly extending slotted lever-arm 56, which lever-arm 56 at its upper end is adjustably connected with the crank-disk 24 on the shaft 22 by means of the link or pitman 57, as best illustrated in Fig. 4.

Upon the rock-shaft 55 any desired number of sleeves 58 are secured, preferably by means of a set-screw, as illustrated in Fig. 1. Each sleeve is provided with a forwardly-extending horizontal arm 59, the outer end of which arm is bifurcated to receive a clamp and a bit-stock, as illustrated in Figs. 1 and 5. The bit-stock consists of a cylindrical body 60, provided with a longitudinal groove 61, and a head or chuck 62 at the lower extremity, adapted to receive a drill or auger 63. The body of the bit-stock is journaled in suitable bearings 64, secured on the front upper cross-bar of the main frame, and similar cross-bars intermediate of the side beams 13 and the upper portion of the body of the main frame. The body 60 of the bit-stock is free to revolve and have vertical play in the bearings 64, and each bit-stock is provided with a pulley 65, which pulley is slid down over the body 60 and provided with an interior longitudinal feather 66, adapted to enter the groove 61 of the said body, as best illustrated in Fig. 5. By reason of this construction the pulleys 65, being loosely keyed to the body of the bit-stock, do not interfere with the vertical movement of the same. The several pulleys 65 are connected by belts 67 with the aligning pulleys 17, secured to the main drive-shaft 16, as illustrated in Figs. 1 and 2.

Each bit-stock is provided at or near the upper end of the body with an attached peripherally-grooved sleeve 68, the groove in

the said sleeve being adapted to receive the bifurcated extremity of an arm 59, projected from the rock-shaft 55. Thus as the rock-shaft is manipulated a vertical movement is communicated to the bit-stock, the said bit-stocks while in their vertical movement being held free to revolve.

A gage-bar 69 is attached at the upper end to one member of the crank-shaft arms 59, as illustrated in Fig. 1, the lower end of which gage-bar is forked, as best shown in Fig. 5, the prongs of the fork being preferably made to extend downward in opposite directions, whereby the space at the extremity of the fork between the tines is the widest. The gage-bars 69 move up and down with the bit-stock, and are held at all times in a predetermined perpendicular position by means of angled blocks 70, attached to one of the cross-bars of the main frame and bearing upon the outer edge of the said gage-bars, as illustrated in Fig. 1. The object of the gage-bar is to retain the slat, when fed forward to be bored, in such a position that the bit or auger will strike the upper surface of the slat at a central point between the sides. The employment of the gage-bar is necessary, since the slats fed to the drills or augers may be more or less warped.

In operation the bit-stocks are represented as being fed downward, a slat having been fed forward in position to be bored, and the said slat having been trimmed at the ends by the saws 41 prior to arriving beneath the bits. The disks 23 and 24 are on their forward throw, whereupon the dogs 31 slide over the ratchet-wheels 30, thus permitting the shaft 25, carrying the chain-wheels, to be idle. The forward throw of the disk 24 elevates the lever-arm 56, rocks the shaft 55, and depresses the shaft-arms 59, which arms carry the bit-stocks downward. As the movement of the shaft 55 is gradual, the bits are also gradually fed into the slats, the said bits being meanwhile rotated by the connection of the bit-stocks with the main drive-shaft 16. As the disks 23 and 24, which move together, are on their rearward throw, the disk 24 raises the bit-stocks and the disk 23, acting upon the disk 27, causes the dogs 31 to engage with the ratchet-wheels 30 and revolve the shaft 25. This sets the endless chains or carriers in motion, and a slat is brought forward to replace the finished slat, which is dropped down to the ground. Just as the slat reaches the proper position beneath the bits the disk 24 commences its forward throw, and likewise the disk 23, whereupon the movement of the shaft 25 is stopped, the rotation of the carrier or endless chain ceases, the bits are again fed downward, and the forked ends of the gage-bars, which project below the bits, are made to span and embrace the slat just fed forward to be bored, and retain said slat in a fixed position in proper alignment with the bits, and as the bit-stocks are fed farther downward the bits are made to enter the slat and properly bore the same. This operation is continuous until a sufficient number of slats have been finished.

In Fig. 9 I illustrate a modified form of carrier. The chain belts and the shafts carrying the chain-wheels are dispensed with, and a shaft 71 is journaled upon the front corner-posts of the main frame near its base, upon which shaft a series of large toothed wheels 72 are secured. The shaft is intermittently rotated in similar manner to the shaft 25 in the form of machine heretofore described by loosely mounting the disk 27 at one end of the said shaft and providing the said shaft with the ratchet-wheels 30, heretofore described in connection with the shaft 25, and the pitman-connection 29 is made between the disk 24 and the disk 27, while the rock-shaft 55 is manipulated by the link or pitman connection with the disk 23.

The platform of the extension of the main frame is provided with a series of spaced longitudinal slats, between which slats the toothed wheels 72 revolve, and the chute 51 is mounted upon the platform and made to project at an inclination downward to deliver the slats to the wheels 72 as they revolve, which wheels, as they receive the slats between the teeth, carry the same upward to the bits, and when a slat is brought in position immediately beneath the bits, as shown in Fig. 9, the wheels 72 cease to revolve, and the bit-stocks are carried downward and the bits permitted to enter the slat.

The intermittent movement of the carrier of the bit-stocks in the modification illustrated in Fig. 9 is identical with the movement of the similar parts in the preferred form of machine illustrated in Fig. 1.

I desire it to be distinctly understood that while I have shown and described specific constructions, other equivalent construction may be employed without departing from the spirit of the invention.

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

1. The combination, with a feed mechanism, of a series of bit-stocks, a rock-shaft carrying bifurcated arms embracing the bit-stocks, gage-bars attached to the said arms at the upper end, extending parallel with the bit-stocks and having a forked lower end, a shaft carrying the feed mechanism, and a drive-shaft provided with cranks adapted to alternately actuate the rock-shaft and the feed-shaft, substantially as shown and described.

2. The combination, with a drive-shaft provided with cranks, one at each end, a feed-shaft, and a carrying mechanism attached to the said feed-shaft, of a rock-shaft, bit-stocks connected with the rock-shaft, a lever-arm attached to one end of the said rock-shaft, a disk loosely mounted upon the feed-shaft carrying dogs, ratchet-wheels secured to the said feed-shaft having contact with the said

dogs, and a pitman-connection between the respective cranks of the drive-shaft and the disk and lever-arm of the rock-shaft, substantially as shown and described.

3. The combination, with a drive-shaft provided with cranks, one at each end, a feed-shaft, and a feed mechanism carried by said shaft, of a rock-shaft provided with a lever-arm at one end, bit-stocks attached to the rock-shaft, a slotted disk loosely mounted upon the feed-shaft carrying spring-actuated dogs, ratchet-wheels secured to the said feed-shaft for contact with the said dogs, a pitman adjustably connecting one crank of the drive-shaft and the slotted disk, and a second pitman adjustably connecting the opposite crank of the drive-shaft and the lever-arm of the rock-shaft, all combined for operation substantially as shown and described.

4. The combination, with a feed mechanism, a series of bit-stocks having a pulley splined thereon, a rock-shaft connected with the bit-stocks, and the main drive-shaft belted to said pulleys, of a shaft carrying a feed mechanism, a second drive-shaft driven from the main shaft and provided with cranks adapted to alternately actuate the rock-shaft and the feed-shaft, a threaded saw-shaft in advance of the drill-stocks, and saws laterally adjustable upon the latter shaft, substantially as shown and described.

5. The combination, with a feed mechanism, substantially as described, a rock-shaft, a series of clutch-arms projected from the rock-shaft, bit-stocks having a pulley splined thereon and embraced by the said clutch-arms, and a gage-rod attached to the extremity of the clutch-arms, provided with a forked lower end, of a main shaft belted to the pulleys of the bit-stocks, a shaft carrying the feed mechanism, a second drive-shaft driven from the main shaft, provided with cranks adapted to alternately actuate the rock-shaft and the feed-shaft, a saw-shaft in advance of the bit-stocks, and saws laterally adjustable upon the latter shaft, all combined for operation, as and for the purpose specified.

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