

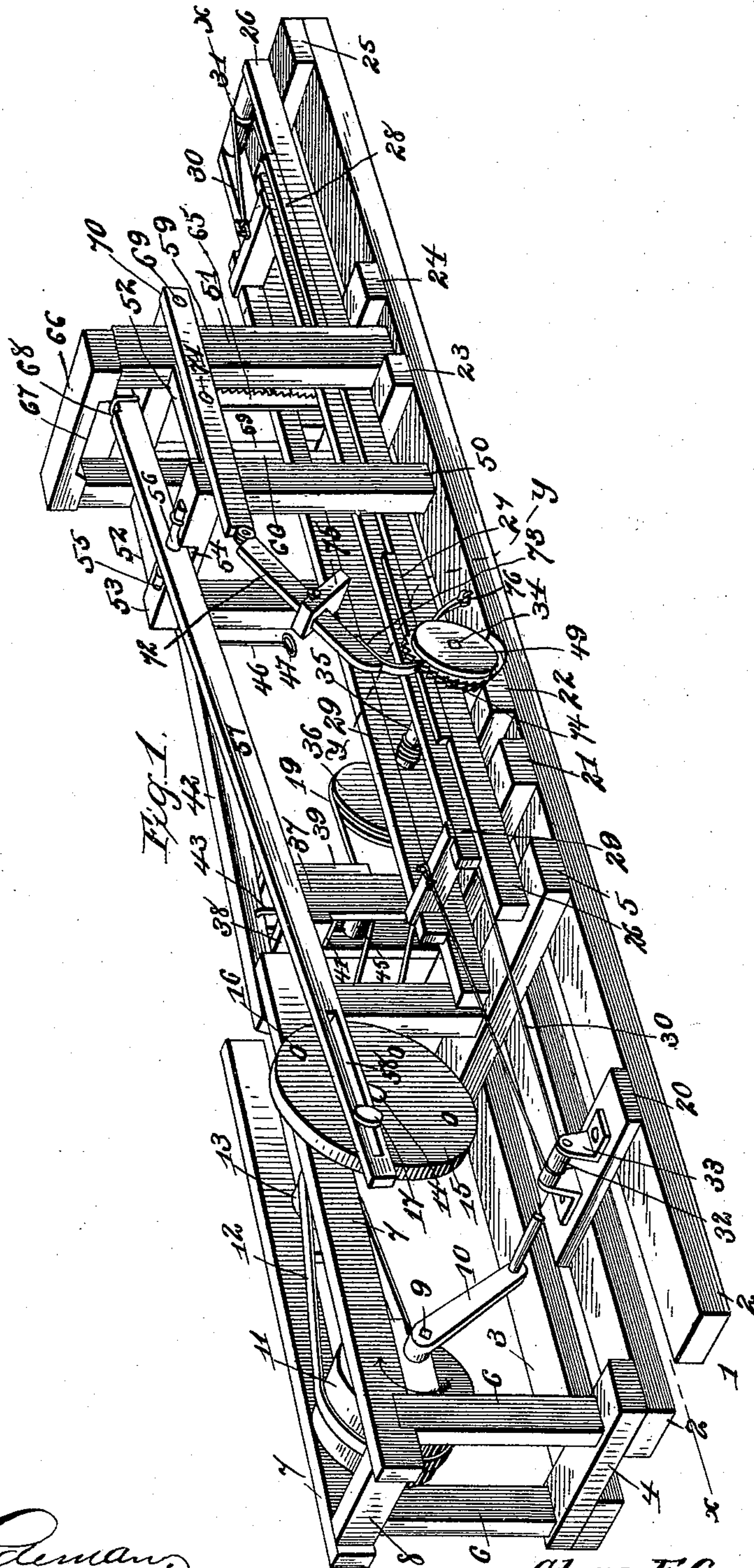
(No Model.)

2 Sheets—Sheet 1.

C. E. CRANFORD.  
SAWMILL.

No. 492,787.

Patented Mar. 7, 1893.



Witnesses

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*Chas. E. Cranford,*

Inventor

By his Attorneys, *Chas. E. Cranford*

*C. E. Cranford*

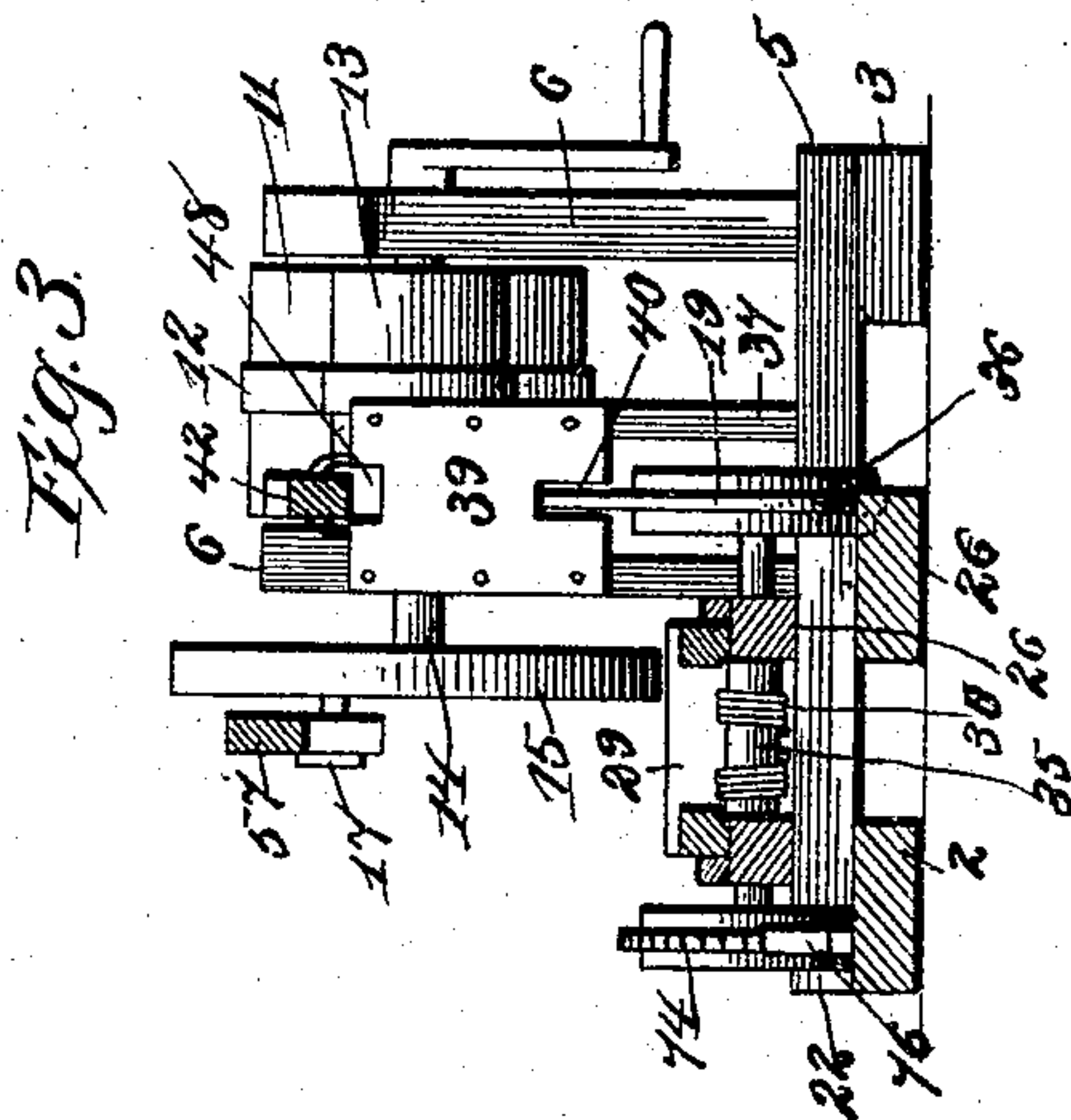
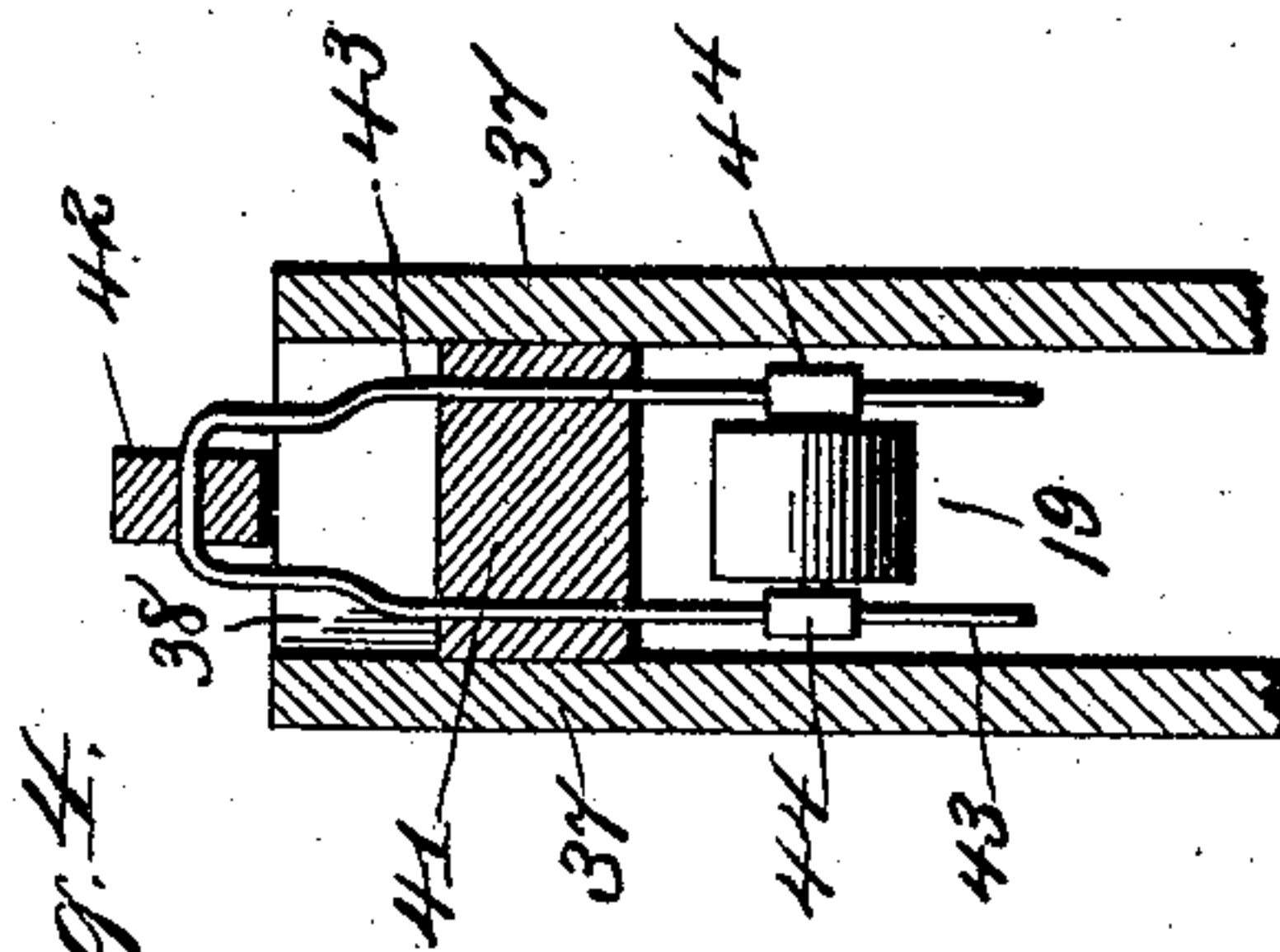
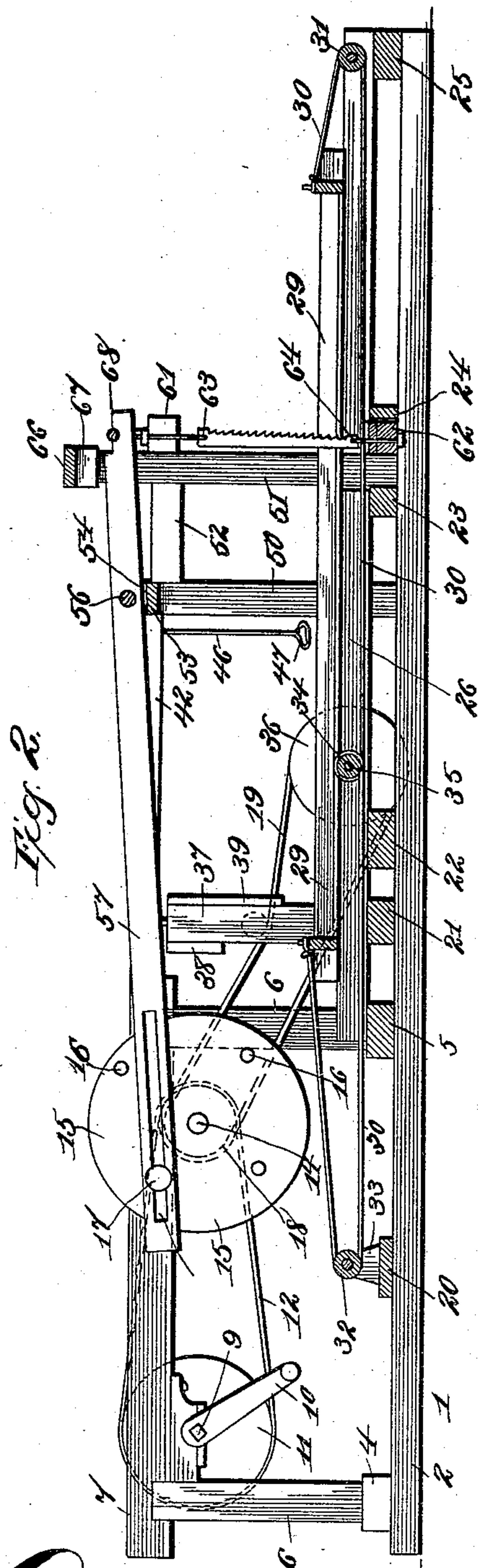
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Witnesses

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# UNITED STATES PATENT OFFICE.

CHARLES E. CRANFORD, OF MOSCOS, MISSISSIPPI, ASSIGNOR OF ONE-HALF  
TO SAMUEL WILLIAMSON, OF SAME PLACE.

## SAWMILL.

SPECIFICATION forming part of Letters Patent No. 492,787, dated March 7, 1893.

Application filed June 20, 1892. Serial No. 437,398. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES E. CRANFORD, a citizen of the United States, residing at Moscos, in the county of Covington and State of Mississippi, have invented a new and useful Sawmill, of which the following is a specification.

This invention relates to certain new and useful improvements in saw mills, and consists of the construction and arrangement of parts thereof, as will be more fully hereinafter described and claimed.

The object of this invention is to simplify the construction and operation of a device of the character set forth, so that the same may be operated by hand power, steam, or horse power, and wherein the parts are specially arranged to increase their efficiency for sawing lumber, and are strong and durable, easily handled and understood, and the device as a whole, comparatively inexpensive.

In the drawings:—Figure 1 is a perspective view of the improved machine. Fig. 2 is a longitudinal section on the line  $x-x$ , of Fig. 1. Fig. 3 is a transverse vertical section on the line  $y-y$ , of Fig. 1. Fig. 4 is a detail sectional view of the belt tightening mechanism.

Similar numerals of reference are employed to indicate corresponding parts in the several views.

Referring to the drawings, the numeral 1 designates a bed of suitable construction, but is preferably formed in the main of two longitudinally disposed parallel beams 2, with a shorter similarly situated beam 3 at one side, and having intervening spaces between the same. The beams 2 and 3 are connected by suitable cross strips arranged at predetermined intervals, and forming supports for the various parts of the mechanism, and will be hereinafter referred to from time to time. The beam 2 on one side is connected to the adjacently situated shorter beam 3, by a cross strip 4 at the ends of said beams, and by a similar strip 5, of greater length, and extending across both of the beams 2, and the innermost end of the said beam 3. Rising from the said strips are parallel uprights or standards 6, connected at their upper ends by longitudinal top strips 7, arranged parallel with each other and held apart the required dis-

tance through the medium of said uprights or standards, and by an end strip 8. A drive shaft 9 is transversely located and has bearing in the strips 7, and to the ends thereof are adapted to be applied suitable parts for revolving the same by steam or horse power, but as shown, the said shaft is arranged to be operated by a crank handle 10 fitted to the end thereof, and whereby manual power may be employed in actuating the different parts of the machine. On the said shaft 9 is mounted a pulley or drum 11, which is adapted to be engaged by a band or belt 12, which runs to and surrounds another pulley or drum 13 mounted adjacent to the opposite ends of the strips 7, on a shaft 14, which is extended through one of the strips, and receives a disk or wheel 15, having a series of openings 16 therein at varying radial distances from the center thereof, and adapted to receive an adjustable headed wrist pin 17.

The drum or pulley 13 is formed with a groove 18, which receives a suitable round belt 19, as will be more fully hereinafter described.

The beams 2 are provided with other connecting supporting strips 20, 21, 22, 23, 24 and 25, arranged at suitable intervals, and are of such elevation or thickness as to properly support the parts in connection therewith. On the strips 5, 21, 22, 23, 24 and 25, are mounted guide or track bars 26, each of which is formed in two parts and separated at the point where the saw frame is located. The said guide or track bars are provided with flanges 27 and 28, which are located on the upper side of the same to properly confine and position the carriage 29 in its movements longitudinally thereon. The said carriage is of elongated form and open, and comprises side and end bars, as fully shown, and connected to the opposite end bars thereof are the opposite ends of a rope, cable or chain 30, which has movement over a grooved pulley or roller 31, journaled between the ends of the guide or track bars 26, at one end, and at the opposite end over a roller or pulley 32, supported by journal blocks 33 rising from the cross strip 20. Extending transversely through the guide or track bars 26 is a shaft 34, having bearing in said bars and provided



with a drum 35, which is confined between said guide or track bars, and upon which the two opposite ends of the rope, cable or chain 30 are adapted to wind in opposite directions accordingly as the carriage 29 moves backward and forward. On one end of the said shaft 34 is keyed a grooved pulley 36, which is engaged by the belt 19, the latter being held in relative position with a belt tightener or tension device. The said belt tightener or tension device comprises two uprights 37 rising vertically from one end of the cross strip 21, and having a connecting cross strip 38 at the upper portion of one side thereof, and a plate 39 secured over the opposite side of said uprights and formed with a slot 40, through which a portion of the said belt 19 passes. The belt 19 travels between the uprights 37, and said uprights form a guide for a plunger 41, connected to an operating lever 42 by parallel arms 43, which extend through the said plunger 41, and have journaled boxes or bearings 44 thereon below the said plunger in and by which is supported a roller 45, which is adapted to contact with the belt 19 to exert the necessary tension thereon to tighten the same, as may be found desirable. The plunger 41 has free movement against and between the uprights 37, and said movement will be regulated by the movement of the lever 42, which is pivoted or fulcrumed to one of the strips 7 at one end, and has a depending operating rod 46 attached to the opposite end thereof and constructed with a lower engaging loop or handle 47.

The arms 43 depend below the roller 45, and form a guide for properly keeping the belt in engagement with the roller 45. The arms 43 are hinged to the lever 42, and thereby the plunger 41 and roller 45 may be readily withdrawn from the support and guide afforded to the same by the standards or uprights 37, whenever such operation may become necessary. The plate 39 has the upper edge thereof slotted or recessed as at 48, in order that the lever 42 may be depressed as low as possible and exert the full influence of the pressure thereon against the belt 19, through the parts heretofore set forth.

By means of the construction just described, the rapidity of movement of the carriage 29 is controlled, and to assist in this movement, a ratchet wheel 49 is secured to the end of the shaft 34, opposite to that to which the pulley 36 is connected, in a manner which will be presently set forth.

A series of uprights 50 and 51 are vertically positioned in connection with the beams 2 and are spaced apart and connected with each other in pairs on opposite sides by strips 52. Connecting the upper portion of the standards or uprights 50 is a cap strip 53, which is removably attached to the upper reduced ends of the standards or uprights set forth, and provided with a longitudinal recess 54, and an upper transverse groove 55, in which is mounted a trunnion 56, extending from a lever 57,

having an elongated slot 58 in the rear end thereof, which is adjustably engaged by the headed wrist pin 17, fitted in the disk or wheel 15. The standards or uprights 51 are located between the cross strips 23 and 24, and are provided with guides 59, in which is mounted a saw frame of substantial rectangular form and consisting of side bars 60, connected by a head bar or block 61, and a foot block 62, whose inner opposing sides have suitable hooks 63 and 64 projecting therefrom, to which the opposite ends of a saw blade 65 are connected. The said hooks 63 and 64 are adjustable, and thereby means for controlling the tension of the saw blade 65 is provided. The forward end of the lever 57 is connected to the central upper portions of the head bar or block 61, and by this means the saw frame and saw blade carried thereby are vertically reciprocated, it being seen that the said saw blade is mounted between the side rails of the carriage 29. The upper ends of the standards or uprights 51 are connected by a head beam 66, having a recess 67 in the under side thereof, which permits the front end of the lever 57 to have free upward movement, the said front end of the said lever being reduced as at 68 to assist in the operation just set forth.

Projecting from one end of the head bar or block 61 of the saw frame is a journal or spindle 69, to which is fitted the front end of a lever 70 having a fulcrum pin 71 extending therethrough and into one of the strips 52 connecting the standards or uprights 50 and 51 on one side. To the said lever 70, at the rear end thereof, is hinged an arm 72, from which extends a push pawl 73 having its outer end formed with a recess 74, adapted to fit over the ratchet wheel 49 and engage the teeth thereof, to feed the carriage 29, and the lumber carried thereby automatically to the saw blade. On the said arm 72 is adjustably mounted a weight 75, which is preferably formed in the shape of a yoke embracing the said arm and adapted to hold the said pawl 73 in engagement with the teeth of the ratchet wheel 49.

From the construction set forth, it will be seen that as the saw frame is vertically reciprocated by the lever 57, the lever 70 is also reciprocated and operates the arm 72, and the push pawl carried thereby, to drag over the teeth of the ratchet wheel 49, to continuously revolve the said wheel. To prevent back movement of the ratchet wheel 49, a stop pawl or dog 76 is secured to an adjacently situated beam 2, and is adapted to engage the teeth of the said wheel 49 with a well known and self evident operation.

When the shaft 9 is operated, and turned in the direction of the arrow shown in Fig. 1, the disk or wheel 15 is actuated through the intermediate mechanism set forth to operate the lever 57, and the saw frame in connection therewith, and simultaneously therewith through the medium of the belt 19, and pulley 36, the shaft 34 is set in motion to feed



the carriage 29, to the said saw frame and saw blade carried thereby, said operation being assisted through the medium of the lever 70, as hereinbefore set forth. During this operation one part of the rope, cable or chain 30 winds around the drum 35, and the other part of said rope, cable or chain unwinds from said drum. To reverse the movement of the said carriage 29, the pawl 74 is disengaged from the ratchet wheel 49, and the shaft 9 revolves in a direction opposite to that indicated by the arrow in Fig. 1 to reverse the movement of the mechanism.

To regulate the speed of stroke or reciprocation of the saw blade 65, the lever 57 is adjusted by removing the wrist pin 17 from its position shown in Fig. 1, and inserting the same in one of the other openings 16, which will quicken or lessen the speed or movement of the said lever, accordingly as the opening 16 with which the wrist pin is in engagement is nearer to or farther away from the center of the disk or wheel 15.

It will be understood that the carriage 29 will be supplied with suitable standards and pillow blocks as well as dogs, to hold the lumber in position thereon, and also that many minor changes might be made and substituted for the construction and arrangement of the parts as shown and described without in the least departing from the nature or spirit of the invention.

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

1. In a saw mill, the combination of a carriage, ropes, cables or chains connected thereto, a drum with which said ropes, cables or chains engage, a ratchet wheel in connection with one part of said drum, a pulley in connection with the opposite part of the drum, a reciprocating saw frame, an operating shaft, a disk or wheel in connection with said operating shaft, a lever adjustably connected with said disk or wheel and to the said saw frame, a belt in connection with the driving shaft and with the pulley on one side of the drum, a belt tightener engaging said belt, and a pawl

engaging said ratchet wheel and operated by the movements of said saw frame, substantially as described.

2. In a saw mill, the combination of a carriage, a drive shaft having pulleys in connection therewith, a disk or wheel in connection with one of said pulleys, a lever adjustably connected at one end to said disk or wheel, a vertically reciprocating saw frame carrying a saw blade, and to which the opposite end of the said lever is attached, a lever connected to said saw frame, and having a pawl hinged thereto, a shaft extending under the carriage carrying a drum and a ratchet wheel on one end adapted to be engaged by said pawl, and a pulley on the opposite end of the same, a belt running from said latter pulley to one of the pulleys connected to the drive shaft and traveling between guides, a plunger mounted between said guides and having a roller depending therefrom to engage said belt, and a lever carrying said plunger and roller, the said carriage having ropes, cables or chains connected to opposite ends thereof and engaging said drum, substantially as described.

3. In a saw mill, the combination of a carriage, a reciprocating saw frame, the drive shaft having pulleys in connection therewith, a shaft extending under said carriage and having a drum thereon, and a ratchet wheel on one end and pulley at the opposite end, a rope, cable or chain connected to opposite ends of the carriage and passing over rollers and engaging said drum, a belt passing over the latter pulley and connected with one of the pulleys of the drive shaft, a belt tightener engaging said belt, and a lever connected to the saw frame, and having a pawl hinged thereto, substantially as described.

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

CHARLES E. CRANFORD.

Witnesses:

JO. SEAL,

D. P. McLaurin.