

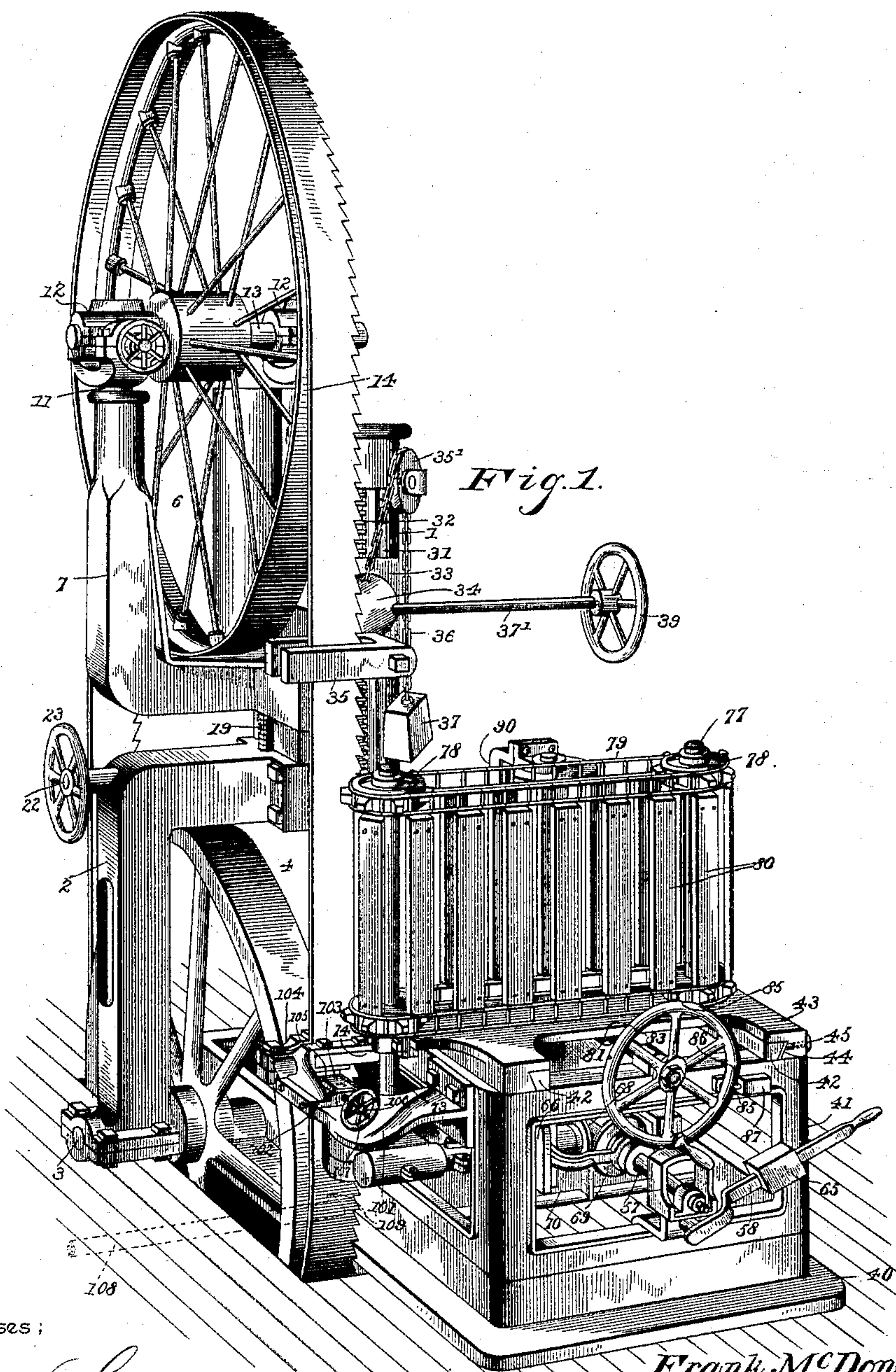
(No Model.)

4 Sheets—Sheet 1.

F. McDONOUGH.
BAND SAW MILL.

No. 485,970.

Patented Nov. 8, 1892.



Witnesses:

J. M. Withers.
Wm. Baggett.

By his Attorneys,

Frank M. McDonough,
C. A. Snow & Co.

Inventor

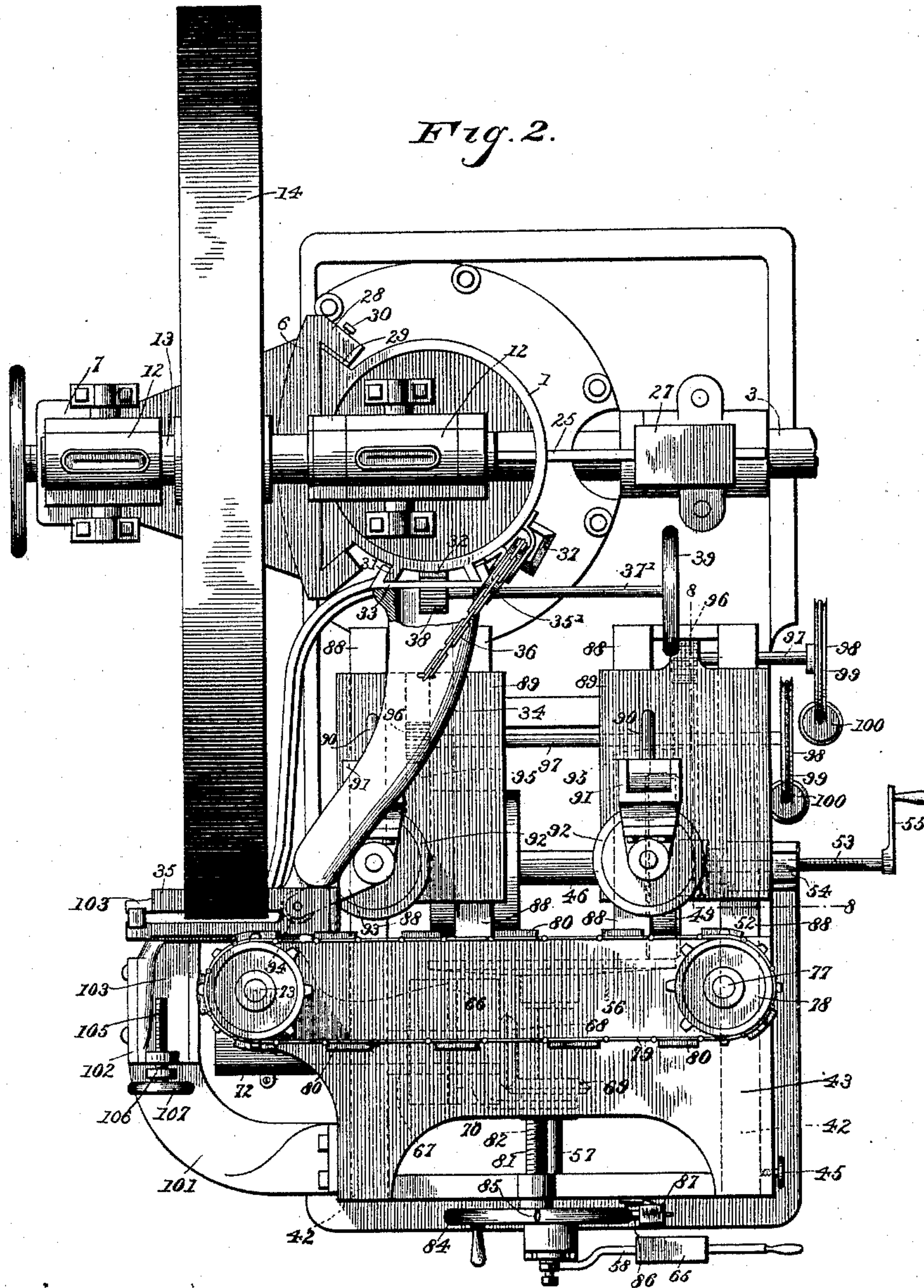
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4 Sheets—Sheet 2.

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Witnesses;

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Inventor

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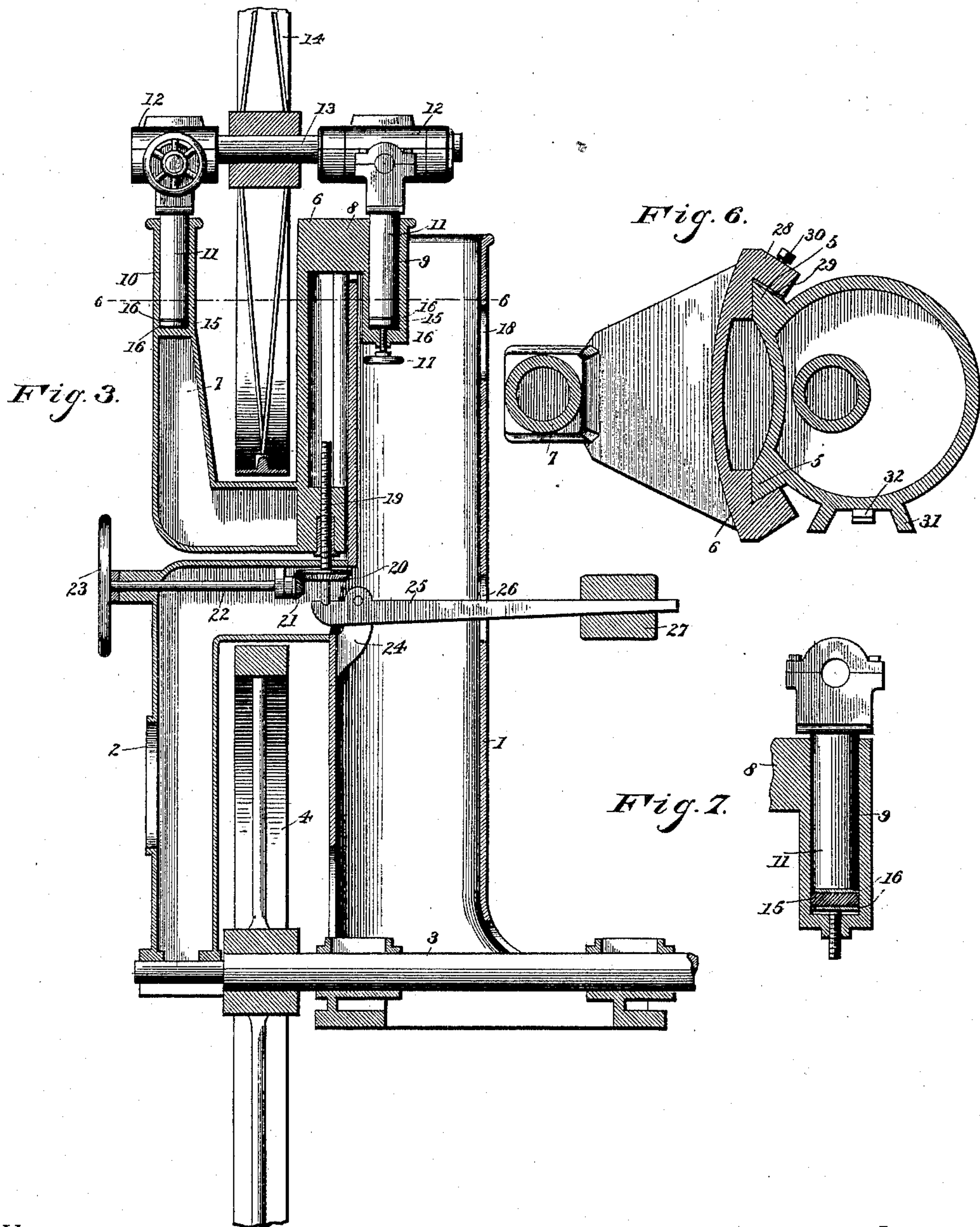
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4 Sheets—Sheet 3.

F. McDONOUGH.
BAND SAW MILL.

No. 485,970.

Patented Nov. 8, 1892.



Witnesses;

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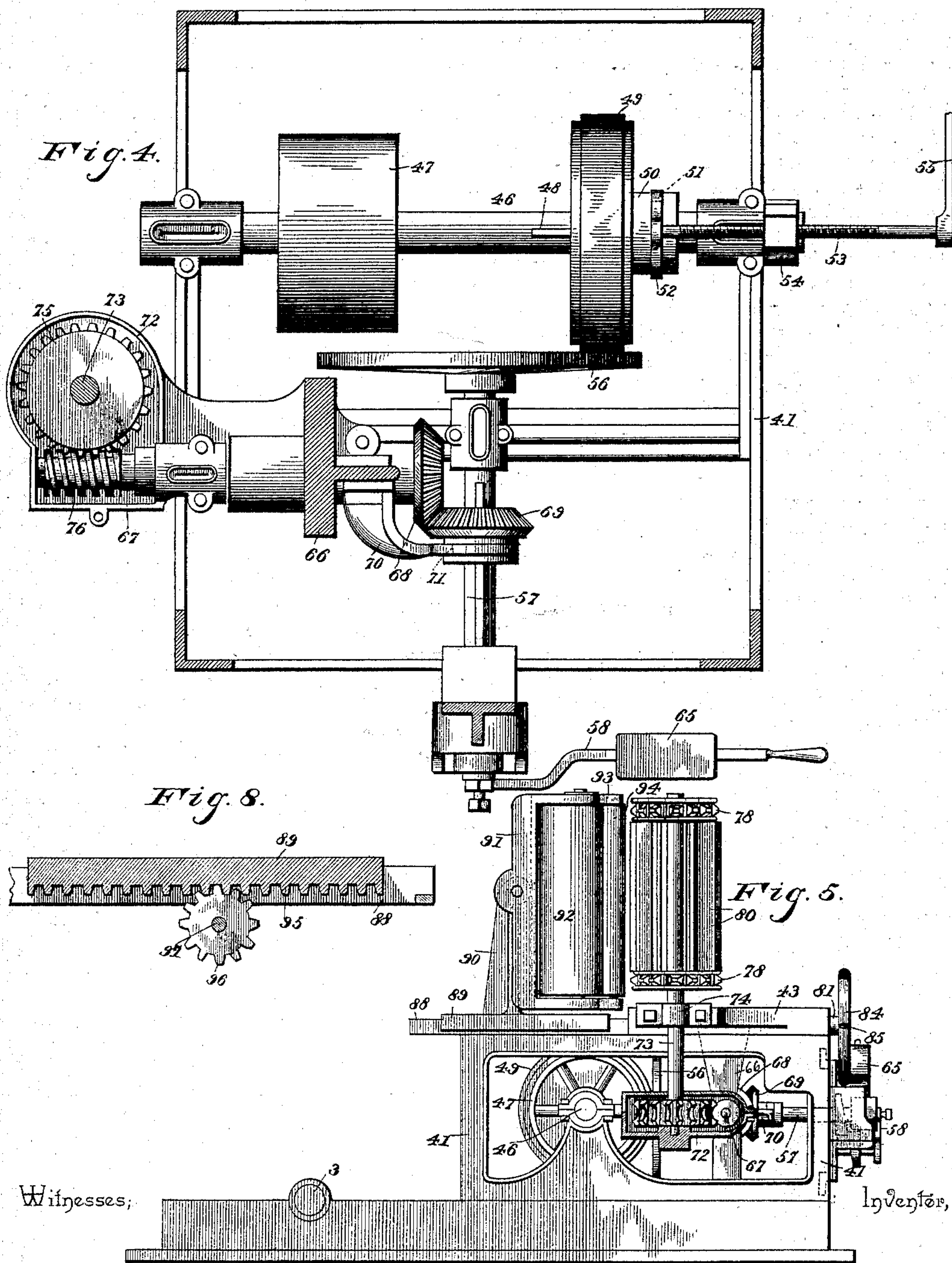
(No Model.)

4 Sheets—Sheet 4.

F. McDONOUGH.
BAND SAW MILL.

No. 485,970.

Patented Nov. 8, 1892.



Witnesses;

Inventor,

Wm. Bagger

By his Attorneys, Frank McDonough,

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UNITED STATES PATENT OFFICE.

FRANK McDONOUGH, OF EAU CLAIRE, WISCONSIN.

BAND-SAW MILL.

SPECIFICATION forming part of Letters Patent No. 485,970, dated November 8, 1892.

Application filed July 3, 1891. Serial No. 398,407. (No model.)

To all whom it may concern:

Be it known that I, FRANK McDONOUGH, a citizen of the United States, residing at Eau Claire, in the county of Eau Claire and State of Wisconsin, have invented a new and useful Band-Saw Mill, of which the following is a specification.

This invention relates to band sawing-machines; and it has particular reference to that class of band sawing-machines which are used for resawing lumber.

The invention has for its object to provide a machine of this class which shall possess superior advantages in point of simplicity, durability, and general efficiency; and with these ends in view the invention consists in certain improvements in the frame structure of the machine whereby the upper saw-carrying wheel shall be evenly balanced and the strain upon the saw equalized.

The invention further consists in the detailed construction of the frame structure whereby the upper adjustable arm carrying the upper saw-carrying wheel shall be held securely and free from vibration.

The invention further consists in an improved feed mechanism composed, essentially, of a vertically-arranged endless carrier and mechanism for adjusting and operating the same.

The invention further consists in certain details of construction and arrangement of parts, which will be hereinafter fully described, and particularly pointed out in the claims.

In the drawings hereto annexed, Figure 1 is a perspective view of a band-saw mill constructed in accordance with my invention. Fig. 2 is a plan view of the same. Fig. 3 is a vertical sectional view taken through the main frame of the machine. Fig. 4 is a horizontal sectional view taken through the casing containing the mechanism for operating the feed mechanism. Fig. 5 is a side elevation, partly in section, of the feed mechanism. Fig. 6 is a horizontal sectional view taken through the line 6 6 in Fig. 3. Fig. 7 is a sectional detail view of one of the bearings for the upper saw-carrying shaft. Fig. 8 is a sectional detail view taken on the line 8 8 in Fig. 2.

Like numerals of reference indicate like parts in all the figures of the drawings.

The main frame of my improved band-saw mill is composed of a tubular upright 1, having a laterally and downwardly extending arm or bracket 2. The lower ends of said upright and bracket are provided with boxes or bearings for the lower saw-carrying shaft 3, having the band-wheel 4. The upright or standard 1 is provided above the arm or bracket 2 with dovetailed guides 5 for the vertically-movable slide or cross-head 6, having the laterally and upwardly extending arm 7. The slide 6 is also provided at its upper end with a bracket 8, extending laterally over the tubular upright 1 and having a socket 9. A similar socket 10 is formed at the upper end of the arm 7. The sockets 9 and 10 are provided with the vertically-movable posts 11, the upper ends of which have the boxes 12, in which is journaled the upper saw-shaft 13, carrying the band-wheel 14. In the sockets 9 and 10 are placed cushions 15, of rubber or other suitable material, interposed between steel plates or washers 16. The lower end of the socket 9 is provided with a set-screw 17, bearing against the lower steel plate or washer 16, thus enabling the cushion or spring to be compressed and vertically adjusted to raise or lower one end of the saw-carrying shaft, thus enabling the latter to be readily adjusted to an absolutely true and level position. The set-screw 17 is accessible through a slot or opening 18 in one side of the tubular upright or standard 1. The cushions support the posts having the bearings in which the upper saw-shaft is journaled, and by their use the necessary and proper strain upon the saw may be readily attained without causing that rigidity of the connecting parts which is liable to result in the course of time in crystallizing the saw and causing the latter to break.

When the fact is considered that in a machine of this class the supports must be exceedingly heavy and rigid and that the band-saw must be run at a high rate of speed, the importance will be appreciated of so mounting the upper saw-carrying shaft as to enable it to yield almost imperceptibly without causing the saw to slip.

In the lower end of the vertically-movable

slide 6 is mounted a screw 19, having a beveled pinion 20, meshing with a beveled pinion 21 upon a shaft 22, which is journaled horizontally in the arm or bracket 2 of the frame, and which is provided with a hand-wheel 23. The tubular standard or upright 1 has an interiorly-arranged bracket 24, to which is pivoted a lever 25, the inner end of which supports the lower end of the vertical screw 19 and the outer end of which extends through a slot 26 in the upright 1 and carries an adjustable weight 27, which balances the weight of the slide 6 and its attachments. By manipulating the hand-wheel 23, the slide 6, with its attachments, may be raised or lowered to adjust the machine to the length of the saw, and the weight 27 may be readily adjusted to regulate the strain upon the latter.

Between the dovetailed guides 5 of the standard and one of the flanges 28 of the slide 6 is interposed a wear-plate 29, which is adjustable by means of set-screws 30, extending through the flange 28. Wear may thus be compensated for and the parts may be held together tightly, so as to avoid vibration of the parts when the machine is in motion and the injurious consequence arising therefrom.

The front side of the upright or standard 1 is provided with dovetailed guides 31, between which is formed a vertical rack 32.

33 designates a slide, which is mounted upon the guides or flanges 31 and which is provided with a forwardly-extending arm 34, having the upper saw-guide 35. A rope, chain, wire, cable, or other suitable flexible connection, one end of which is attached to the arm 34, is carried over a suitably-arranged guide-pulley 35', and the free end of said flexible connection 36 carries a counter-weight 37, which balances the weight of the slide, arm, and saw-guide. The slide 33 forms a casing in which is journaled a shaft 37', having at its inner end a pinion 38, meshing with the rack 32. The outer end of the shaft 37' has a hand-wheel 39, by means of which it may be manipulated to adjust the upper saw-guide vertically to any desired position.

The base 40, which supports the upright or standard 1, is extended forwardly to support the frame or casing 41, which is provided on its upper side with dovetailed guides or flanges 42 for the sliding bed 43, between one of the flanges of which and the adjacent dovetailed guide 42 a wear-plate 44 is interposed, set-screws 45 being provided for the purpose of tightening the latter. Suitably mounted transversely in the casing 41—that is, parallel to the saw-shafts of the machine—is the main drive-shaft 46, having a pulley or drum 47 to receive motion by means of a belt or band from any suitable power. Mounted slidably upon the main shaft 46 and connected with the latter by means of a key or feather 48 is a friction-wheel 49, the hub of which has an annular groove 51 engaging

the intumed ends of a yoke 52, which is swiveled at the end of a screw 53, which is mounted in a suitable-threaded bearing 54 at the side of the casing. The outer end of the screw 53 has a crank or handle 55, by means of which it may be manipulated for the purpose of adjusting the friction-wheel 49 longitudinally upon the shaft 46. This is for the purpose of moving the said friction-wheel toward or from the center of a friction-disk 56, which is mounted upon a shaft 57, journaled in suitable bearings in the casing at right angles to the main shaft 46. By thus adjusting the friction-wheel 49 the speed at which the friction-disk 56 and the shaft 57 are rotated may be easily and conveniently regulated.

In a suitable bearing at the front end of the casing 41 is mounted a weighted lever 58, having an eccentric disk bearing against a corresponding disk at the front end of the shaft 57, which latter, however, may rotate independently of the said eccentric disk. The said shaft may thus be forced in a rearward direction with a degree of pressure which may be regulated by adjusting the weight 65 upon the lever 58, thus regulating the degree of pressure of the friction-disk 56 against the wheel 49.

The under side of the sliding bed 43 has a downward-extending bracket 66, provided with bearings for a shaft 67, which is parallel to the main shaft 46 and which is provided on its inner end with a bevel-gear 68, meshing with a pinion 69, which is keyed upon the shaft 57, on which latter it may be moved longitudinally. 70 is an arm extending from the bracket 66 and having a bifurcated end engaging an annular groove 71 in the hub of the pinion 69. It will thus be seen that when the bed 43 is moved longitudinally upon the guides or ways of the casing 41 it carries with it the pinion 69, which is thus constantly held in engagement with the pinion or bevel-gear 68, thus transmitting rotary motion to the latter and to the shaft 67 from the shaft 57. The outer end of the shaft 67 is extended into a casing 72, which is suitably attached to or connected with the brackets 66, depending from the sliding bed 43. Said casing has a bearing for the lower end of a shaft 73, which occupies a vertical position and which has an additional bearing 74 in a bracket extending laterally from the sliding bed. The shaft 73 carries within the casing 72 a worm-gear 75, meshing with a worm 76 upon the shaft 67, from which a rotary motion is thus transmitted to the vertical shaft 73.

The bed 43 is provided at its opposite end with a vertical shaft 77, which is parallel to the shaft 73. The shafts 73 and 77 are provided with sprocket-wheels 78, carrying the endless chains 79, which are connected with each other by means of vertical slats 80, thus constituting an endless carrier which forms the feeding device of my improved band-saw mill, and to which motion is imparted through

the shaft 73 from the operating mechanism contained within the casing 41, as herein described. It will be observed that the bed supporting the endless carrier may be moved longitudinally upon its supporting frame or casing toward or from the saw without interrupting the motion of the endless carrier, owing to the means herein described for transmitting motion, which includes the longitudinally-movable pinion 69, which moves with the bed upon the shaft 57 on which it is mounted.

Suitably journaled upon the front end of the frame or casing 41 is a shaft 81, having a screw-threaded portion 82, which works in a nut or screw-threaded bearing 83 upon the under side of the sliding bed. The front end of the shaft 81 has a hand-wheel 84, by means of which it may be manipulated to effect the longitudinal adjustment of the sliding bed and its attachments. The screw-threaded portion of the shaft 81 being of a known pitch—say, four threads to the inch—it follows that one complete revolution of the said screw or shaft will cause the bed to be moved to the extent of one-fourth of an inch. The rim of the hand-wheel is provided with a series of equidistant notches 85, of which in the drawings hereto annexed four have been shown. These notches are capable of being engaged by a spring-actuated stop or catch 86, arranged in a suitable casing 87, attached to the frame of the machine. This stop or catch will thus form a gage, by means of which the movement of the sliding bed may be accurately regulated, each quarter of a revolution of the shaft and hand-wheel serving to move the said bed over a space of one-sixteenth of an inch, provided that the hand-wheel is provided with four equidistant notches and the screw with four threads to the inch, as will be readily understood. The face of the endless carrier, which constitutes the feeding device, may thus be readily adjusted at any desired distance from the saw.

The frame or casing 41 is provided on its upper side in rear of the endless carrier with the parallel pairs of dovetailed guides or ways 88, for the independently-movable slides 89, of which two are usually employed, one near each side of the frame. These slides are provided with upwardly-extending brackets 90, to the upper ends of which are hinged the yokes 91, carrying the vertical rollers 92. One of the yokes 91, which is nearest the saw, is provided with laterally-extending arms or brackets 93, between which is journaled an additional smaller roller 94, for the purpose of holding the material that is to be cut back against the saw. These guide-rollers being mounted, as described, in the hinged or pivoted yokes or frames will readily adjust themselves to uneven surfaces, as will be readily understood. The slides 89 are provided on their under sides with longitudinal rack-bars 95, engaging pinions 96, which are

mounted upon the inner ends of shafts 97, suitably journaled in the side of the frame or casing. The outer ends of the shafts 97 are provided with grooved wheels 98, to the peripheries of which are attached cords 99, the free ends of which have weights 100, the action of which is to force the slides 89 in the direction of the endless carrier and to hold the material that is to be sawed in contact with the latter. It will be seen that the said slides are arranged to operate independently of each other. Consequently lumber of irregular shapes may be conveniently operated upon, the said slides and rollers adjusting themselves automatically to different thicknesses.

I desire it to be understood that while in the drawings hereto annexed only two of the slides carrying rollers have been shown, any desired number may be used without departing from my invention. Ordinary weighted levers may also, if desired, be substituted for the grooved wheels having the weights attached thereto, although the latter will be found preferable as having a greater range of motion.

The frame or casing 41 is provided with a laterally-extending bracket 101, having dovetailed guides or ways 102 for the longitudinally-movable slide 103, carrying the lower saw-guide 104. A screw 105, which is mounted in a threaded bearing 106 at the front end of the bracket, is provided with a hand-wheel 107, by operating which the slide carrying the saw-guide may be adjusted longitudinally to any desired position.

108 designates a water-supply pipe terminating in a nozzle 109, which is arranged to discharge water upon the saw at a point close to the lower saw-guide for the purpose of cleaning the saw from pitch and similar impurities which are apt to adhere to the saw. The saw-blade will carry a portion of the water to the faces of the wheels 4 and 14, which are thus likewise kept clean.

The operation of this invention will be readily understood from the foregoing description taken in connection with the drawings hereto annexed. The slide 6, carrying the upper saw-shaft, may be adjusted vertically by manipulating the hand-wheel 23 for the purpose of taking up slack in the saw or for the purpose of removing the latter or fitting it to the machine, as may be required. The strain from the saw may be regulated by adjusting the weight 27 upon the lever 26. The upper saw-shaft may be leveled and adjusted by means of the set-screw 17, and the cushions or springs supporting the posts 11 will contribute to an easy and yielding movement of the machine. The feed mechanism is simple in construction and efficient in operation. The endless carrier has a continuous movement which enables the lumber that is to be resawed to be continuously fed to the machine, and the pressure-rollers 92, whereby the lumber is held in contact with the said endless carrier, will readily adapt themselves to any

inequalities that may occur in the lumber which is to be resawed. The speed of the endless carrier may be regulated while the machine is in operation by adjusting the position of the friction-wheel 49 with relation to the center of the disk 56, the speed being obviously increased by moving the wheel 49 toward the center of the disk 56. The arrangement of the saw-guides is simple and convenient, and the general construction of the machine is such as to insure strength, durability, and ease of operation.

I desire to be understood that while I have in the foregoing described the preferred construction of my invention I do not limit myself to the precise details herein described, but reserve the right to make any changes and modifications to which recourse may be had without departing from the spirit of my invention.

Having thus described my invention, what I claim is—

1. In a band-saw mill, the tubular standard or upright having a laterally and downwardly extending arm or bracket and provided above said bracket with dovetailed ways or guides, in combination with a vertically-movable slide mounted upon said dovetailed ways and having a laterally and upwardly extending bracket and provided at its upper end with a laterally-extending arm having a socket extending downwardly within the tubular upright, the posts mounted in said socket and in the upwardly-extending arm of the slide, and the upper saw-shaft journaled in bearings at the upper ends of said posts, substantially as set forth.

2. In a band-saw mill, the combination of the tubular upright having dovetailed ways or guides, the slide mounted upon the latter and having arms or brackets provided with sockets, one of which extends downwardly in the tubular upright, the posts mounted in said sockets and having bearings at their upper ends for the upper saw-shaft, the springs or cushions mounted in the sockets below the said posts, and the steel plates or washers arranged adjacent to the upper and lower sides of said springs or cushions, substantially as set forth.

3. The combination, with the vertically-arranged endless carrier adapted to be adjusted to a fixed position, of the separate independently movable and yielding slides having upwardly-extending brackets, means for normally pressing said slides automatically toward the carrier, separate automatically and independently adjustable roller-yokes pivotally connected at their centers to the upper ends of said brackets and thus free to move to automatically adjust themselves to uneven surfaces, separately-movable pressure-rollers journaled in each of said yokes, and means for automatically forcing said slides in the direction of the endless carrier, substantially as set forth.

4. The combination, with a band sawing-machine, of a feeding device comprising an adjustable bed mounted slidingly upon a suitable frame or casing in front of the saw, an endless carrier mounted upon vertical shafts having bearings in said bed, a horizontal shaft journaled in a bracket extending downwardly from the sliding bed and having at its outer end a worm meshing with a worm-gear upon the lower end of one of the vertical shafts and at its inner end a beveled pinion, a horizontal shaft mounted to slide longitudinally in the frame or casing and having a sliding pinion keyed thereon and connected with the sliding bed and a cam-disk at one end, a friction-disk at the inner end of the horizontal shaft, journaled in the casing, a weight-controlled cam-disk adjacent to said cam-disk on the longitudinally-sliding shaft and bearing thereon to regulate the pressure of said friction-disk against the object with which it contacts, and means for transmitting motion at variable rates of speed to the said friction-disk, substantially as and for the purpose set forth.

5. In a band-saw mill, the combination, with the vertically-arranged endless carrier, of the independently-movable slides, roller-yokes pivotally mounted upon said slides and free to move thereon, pressure-rollers journaled in said yokes, the yoke nearest the saw being provided with laterally-extending arms or brackets, a supplemental smaller pressure-roller journaled between said arms or brackets, and means for moving said slides, substantially as set forth.

6. In a feeding device for band-saws, the combination of the frame having parallel pairs of dovetailed guides or ways, the vertically-arranged endless carrier, the separate independently-movable pressure-roller slides having separate movable pressure-rollers, rack-bars upon the under sides of the independently-movable slides, and pinions engaging said rack-bars and mounted upon separate parallel shafts having grooved wheels at their outer ends and weighted ropes connected with said wheels and adapted to rotate the shafts to force the slides carrying the pressure-rollers automatically in the direction of the endless carrier and entirely independently of each other, so that the pressure-rollers will readily adjust themselves to uneven surfaces and the slides correspondingly yield, substantially as and for the purpose set forth.

7. In a band-saw mill, the combination of the tubular upright having dovetailed ways or guides, the slide mounted upon the latter and having arms or brackets provided with sockets, one of which extends downwardly in the tubular upright, and the posts mounted in said sockets and having bearings at their upper ends for the upper saw-shaft, substantially as described.

8. In a band-saw mill, the combination of the tubular upright having dovetailed ways or guides, the slide mounted upon the latter

and having arms or brackets provided with sockets, one of which extends downwardly in the tubular upright, the posts mounted in said sockets and having bearings at their upper ends for the upper saw-shaft, and the springs or cushions mounted in the sockets below the said posts, substantially as described.

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

FRANK McDONOUGH.

Witnesses:

F. H. BROWN,
B. HOGAN.