

No. 687,993.

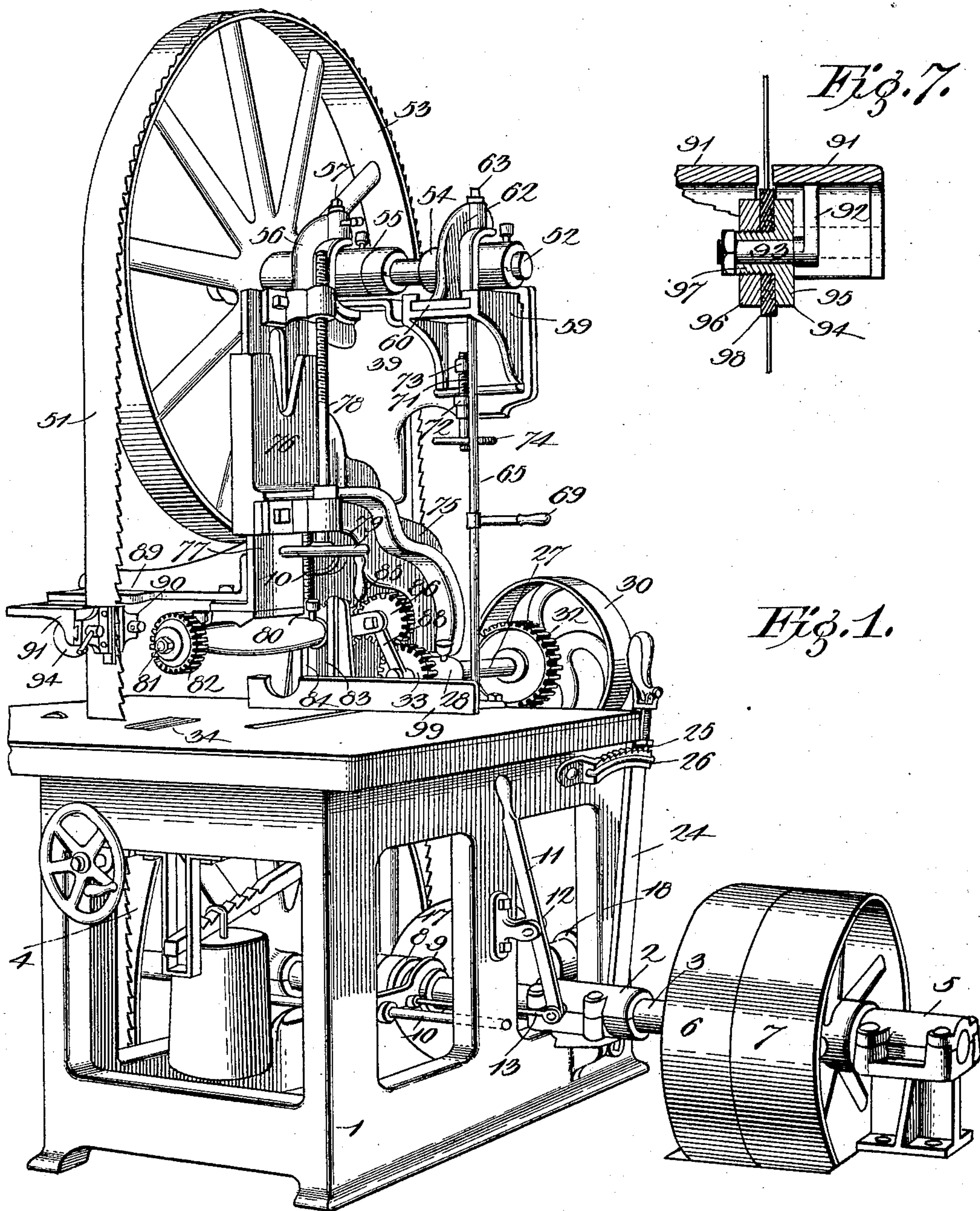
Patented Dec. 3, 1901.

F. DIEHL.
BAND SAWING MACHINE.

(Application filed Mar. 6, 1901.)

(No Model.)

3 Sheets—Sheet 1.



Witnesses

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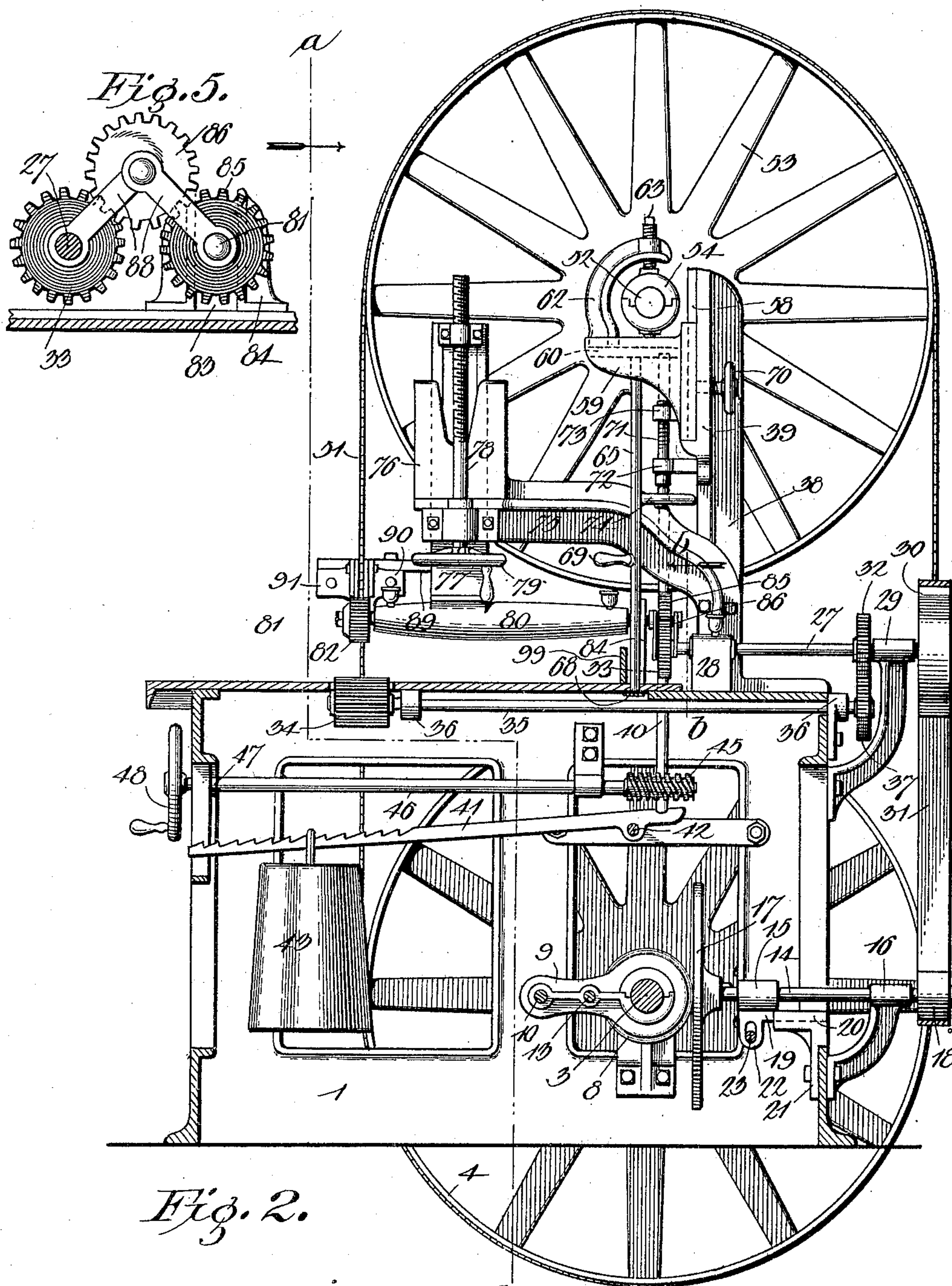
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3 Sheets—Sheet 2.



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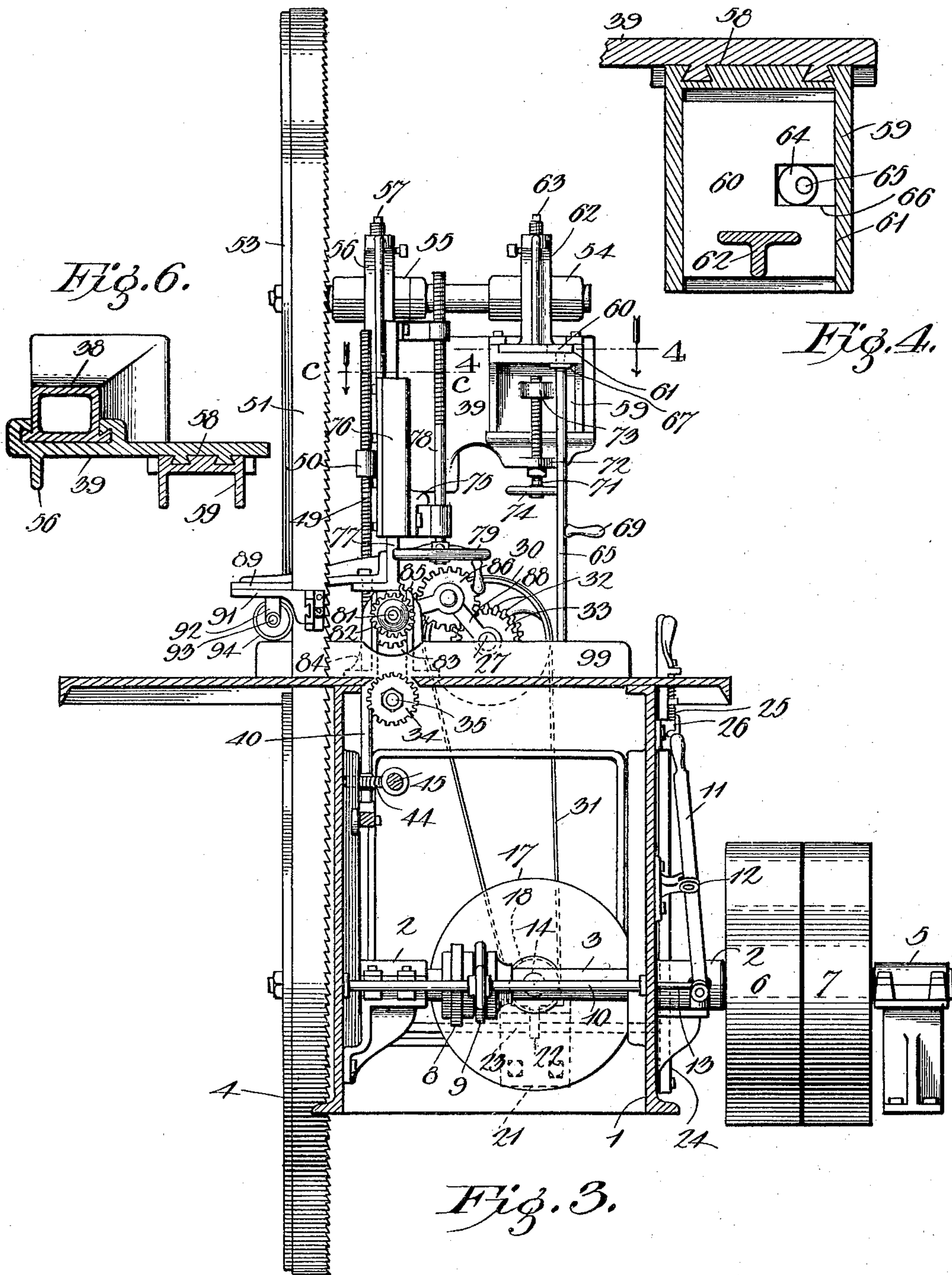
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3 Sheets—Sheet 3.



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UNITED STATES PATENT OFFICE.

FRANK DIEHL, OF SHEBOYGAN, WISCONSIN.

BAND SAWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 687,993, dated December 3, 1901.

Application filed March 6, 1901. Serial No. 50,084. (No model.)

To all whom it may concern:

Be it known that I, FRANK DIEHL, a citizen of the United States, residing at Sheboygan, in the county of Sheboygan and State of Wisconsin, have invented a new and useful Band Sawing-Machine, of which the following is a specification.

My invention is an improved sawing-machine; and it consists in the peculiar construction and combination of devices herein-after fully set forth and claimed.

The object of my invention is to effect improvements in the feed-rollers for feeding the work to the band-saw and in the means for operating said feed-rollers so that both the lower and the upper feed-rollers are positively driven and the upper feed-roller is adapted to be vertically adjusted at will.

In the accompanying drawings, Figure 1 is a perspective view of a band sawing-machine constructed in accordance with my invention. Fig. 2 is a vertical sectional view of the same. Fig. 3 is a similar view taken on a plane indicated by the line *a a* in Fig. 2. Fig. 4 is a detail sectional view taken on a plane indicated by the line 4 4 of Fig. 3. Fig. 5 is a detail sectional view taken on a plane indicated by the line *b b* of Fig. 2 and representing the gears which connect the shaft of the upper feed-roller to the shaft which is also geared to the lower feed-roller. Fig. 6 is a detail sectional view taken on a plane indicated by the line *c c* of Fig. 3. Fig. 7 is a detail sectional view of the guide-wheel for the band-saw.

The table or frame 1, which may be of the form here shown or any other suitable form, is provided with bearings 2 for a power-shaft 3, which shaft carries the lower band-wheel 4. A suitable bearing 5 for one end of the shaft 3 is secured on the floor or any other suitable support. Said shaft 3 has the usual fast pulley 6 and loose pulley 7. A friction-wheel 8 is splined on the power-shaft and is engaged by a shifting-arm 9, which operates on a traveler 10 and is adjusted by a hand-lever 11. The latter is fulcrumed to a suitable supporting-bracket 12 on one side of the frame or table and is connected to the shifting-arm by a rod 13. A counter-shaft 14 is disposed at right angles to the power-shaft 3, is journaled in suitable bearings 15 16, and

has a friction-disk 17 at its inner end, which is engaged by the friction-wheel 8. The latter being adapted to be shifted on the face of the friction-disk toward and from the center thereof by the means hereinbefore described, the counter-shaft may be driven at any desired rate of speed, as will be understood. At the outer end of the counter-shaft 14 is a pulley 18 of suitable size.

The bearing 15 has a slide 19, which operates in a guideway 20, with which a supporting-bracket 21 is provided, and said bearing 15 is swiveled or otherwise suitably connected to the counter-shaft 14, so that the latter may be moved endwise by the said bearing. Said bearing 15 has a slot 22, which is engaged by a rod 23, that projects from a lever 24. By shifting the said lever the shaft 14 may be moved longitudinally to engage the friction-disk 17 with the friction-wheel 8 or disengage it therefrom and to vary the compression of the friction-disk on the friction-wheel as may be required. The said shifting-lever 24 is provided with a spring-pressed locking-dog 25 of usual construction, which by engagement with a segment 26 on one side of the frame or table locks the said shifting-lever at any desired adjustment.

A shaft 27, which is disposed above the top of the table at one side thereof, is journaled in bearings 28 29. Said shaft is provided at its outer end with a pulley 30, which is connected to the pulley 18 on counter-shaft 14 by an endless belt 31. Said shaft 27 has a spur-wheel 32 near its outer end and a similar spur-wheel 33 near its inner end. A lower corrugated or toothed feed-roller 34 is disposed under the top of the table and operates in an opening therein, the upper side of said lower feed-roller projecting slightly above the top of the table. Said lower feed-roller is carried and is revolved by a shaft 35, which is journaled in bearings 36. Said shaft has at its outer end a spur-gear 37, which is engaged by the spur-gear 32 on shaft 27. Hence power is communicated to the lower feed-roller, as will be understood.

A standard 38 is secured on the table near one side thereof and in rear of the shaft 27. Said standard has near its upper end on its inner side a vertically-movable arm 39, which carries the bearings for the shaft of the up-

per band-wheel. The said arm 39 is supported by a vertically-movable shaft 40, the lower end of which bears on a beam 41, which is fulcrumed, as at 42, and has an adjustable weight 43. A worm-wheel 44 is fast on said shaft 40 near the lower end thereof and is engaged by a worm 45 on a shaft 46, which shaft is journaled in suitable bearings 47 and has a hand-wheel 48 at its outer end. The upper portion of the shaft 40 is screw-threaded, as shown at 49 in Fig. 3, the said threaded portion of said shaft engaging a threaded opening in a lug 50, which projects from the rear side of the vertically-movable arm 39. Thereby the latter may be adjusted, as will be understood, to regulate the tension of the band-saw 51, which is carried by the lower and upper band-wheels.

The shaft 52 of the upper band-wheel 53 is journaled in sleeve-bearings 54 55, the former being near the front end of said shaft and the latter being near the rear end thereof. The arm 39 has a curved bracket-support 56, in which are disposed adjusting-screws 57, which are in vertical alinement with each other and bear, respectively, above and below the sleeve-bearing 55, their inner ends being socketed therein.

On one side of the arm 39, near the front end thereof, is a vertical guideway 58, on which is fitted a vertically-movable bracket 59. A horizontally-disposed longitudinally-movable slide 60 is supported in a guideway 61, with which the said bracket 59 is provided. Said slide has on its upper side a curved arm 62. The bearing-sleeve 54 is supported by adjusting-screws 63, one of which is carried by the slide 60 and bears under the said sleeve-bearing and the other adjusting-screw operating in a threaded opening in the arm or bracket 62 and engaging the upper side of the said sleeve-bearing. The inner ends of said adjusting-screws are socketed in said sleeve-bearing. It will be understood from the foregoing that by vertically moving the bracket 59 the front end of shaft 62, which carries the upper band-wheel, may be raised or lowered in order to correspondingly adjust the band-wheel 53 to retain the band-saw thereon, and it will be further understood that by adjusting the slide 60 the inner end of the said shaft 52 may be adjusted in a horizontal plane in order to adjust the operative lead of the band-saw as may be required by the work. Said slide 60 is adjusted, by means of a cam 64, on the upper end of a shaft 65, said cam operating in an opening 66 in said slide and said shaft being journaled in suitable bearings 67 68 in the bracket 59 and table, respectively, and being provided with a handle 69, which is grasped by the operator and manipulated as may be required. A set-screw 70 engages the bracket 59 and serves to secure the same at any desired adjustment. An adjusting-screw 71 is swiveled in a lug 72, which projects from the inner side of arm 39, and said adjusting-screw engages a threaded lug 73, with which

the bracket 59 is provided. A hand-wheel 74 is attached to the lower end of said adjusting-screw. The latter, as will be understood, serves to vertically adjust the bracket 59 on the arm 39, and hence to vertically adjust the front end of shaft 52.

An arm 75 is bolted to the standard 38 and extends transversely over the table. The said arm has a vertical guideway 76, in which operates a vertical slide 77. An adjusting-screw 78, swiveled or otherwise connected to and carried by the said arm, serves to adjust said slide 77. Said adjusting-screw has a hand-wheel 79 at its lower end. At the lower end of the vertically-adjustable slide 77 is a tubular bearing 80, in which is journaled the shaft 81, that carries the upper feed-roller 82. The inner portion of said shaft travels in a vertical way 83 in a standard 84, that rises from the table, and near the inner end of said shaft is a spur-wheel 85, which is engaged by an idler 86, the latter also engaging the spur-wheel 33 on shaft 27. The bearings for the said idler are in flexibly-jointed links 88, which connect the shafts 81 and 27 together, and said idler, as will be understood, moves concentrically with said shafts and serves to communicate power from the shaft 27 to the shaft 81, while allowing of the vertical adjustment of the latter by the slide 77.

It will be understood from the foregoing that both the upper and lower feed-rollers are positively driven under all conditions when the machine is in operation.

The slide 77 is provided with a horizontally-disposed rearward-extending arm 89, which has the guides 90 91, that bear on opposite sides of the operating-lead of the band-saw. The said arm 89 is provided in rear of the guide 91 with a depending standard 92, in which is secured a pin 93. A guide-wheel 94, which bears on the rear side of the band-saw, is journaled on the said pin. The said guide-wheel comprises the two circular sections 95 96, the former being provided with a central threaded boss 97, onto which the section 96 is screwed. A disk 98, of leather or other suitable material, is clamped between the two sections of the guide-wheel, and said disk bears on the rear side of the band-saw.

The table 1 is provided with a suitable gage-plate 99, as is usual in machines of this class.

Having thus described my invention, I claim—

1. The combination of a table, a fixed support above the same, a vertically-adjustable bearing carried by said fixed support, a feed-roller having its shaft journaled in said vertically-adjustable bearing, a spur-gear on said feed-roller shaft, a power-shaft, a spur-gear thereon, flexibly-jointed links connecting said feed-roller shaft and said power-shaft, and an idler-gear carried by said flexibly-jointed links and engaging and connecting said gears on said roller and power shafts, substantially as described.

2. The combination of a table, a fixed sup-

port above the same, a vertically-adjustable bearing carried by said fixed support, an upper feed-roller shaft journaled in said bearing and having a gear, a power-shaft, a gear thereon, flexibly-jointed links connecting said upper feed-roller shaft and said power-shaft, an idler-gear carried by said flexibly-jointed links and engaging said gears on said upper feed-roller shaft, and said power-shaft, a lower feed-roller shaft under said table, and connections between said power-shaft and said lower feed-roller shaft, to drive the latter, substantially as described.

3. In a machine of the class described, a table having on its upper side a standard 84 provided with a vertical guideway 83, a fixed support above said table, a vertically-adjustable bearing carried by said fixed support, an upper feed-roller shaft journaled in said bearing and adapted to travel in said guideway 83, a power-shaft, a gear on said upper feed-roller shaft, a gear on said power-shaft, flexibly-jointed links connecting said shafts, an idler-gear carried by said flexibly-jointed links and engaging and connecting the gears on said upper feed-roller shaft and power-shaft, and a lower feed-roller shaft under said

table and connected to and driven by said power-shaft, substantially as described.

4. In a band sawing-machine, the combination of a table having a standard provided with a vertical guideway, an arm over said table having a vertical guide, a vertically-movable slide adjustable in said guide and having a bearing at its lower end, a shaft journaled in said bearing and operating in the said vertical guideway of said table, a feed-roller carried by said shaft, a gear 85 on said shaft, a shaft 27, means to rotate the latter, a gear 33 on said shaft, flexibly-jointed links connecting said shaft 27 to the shaft of said feed-roller, an idler-gear carried by said flexibly-jointed links and engaging said gears 33, 85, and a lower feed-roller having its shaft geared to said shaft 27, 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.

FRANK DIEHL.

Witnesses:

E. B. MATTOON,
N. S. GOODELL.