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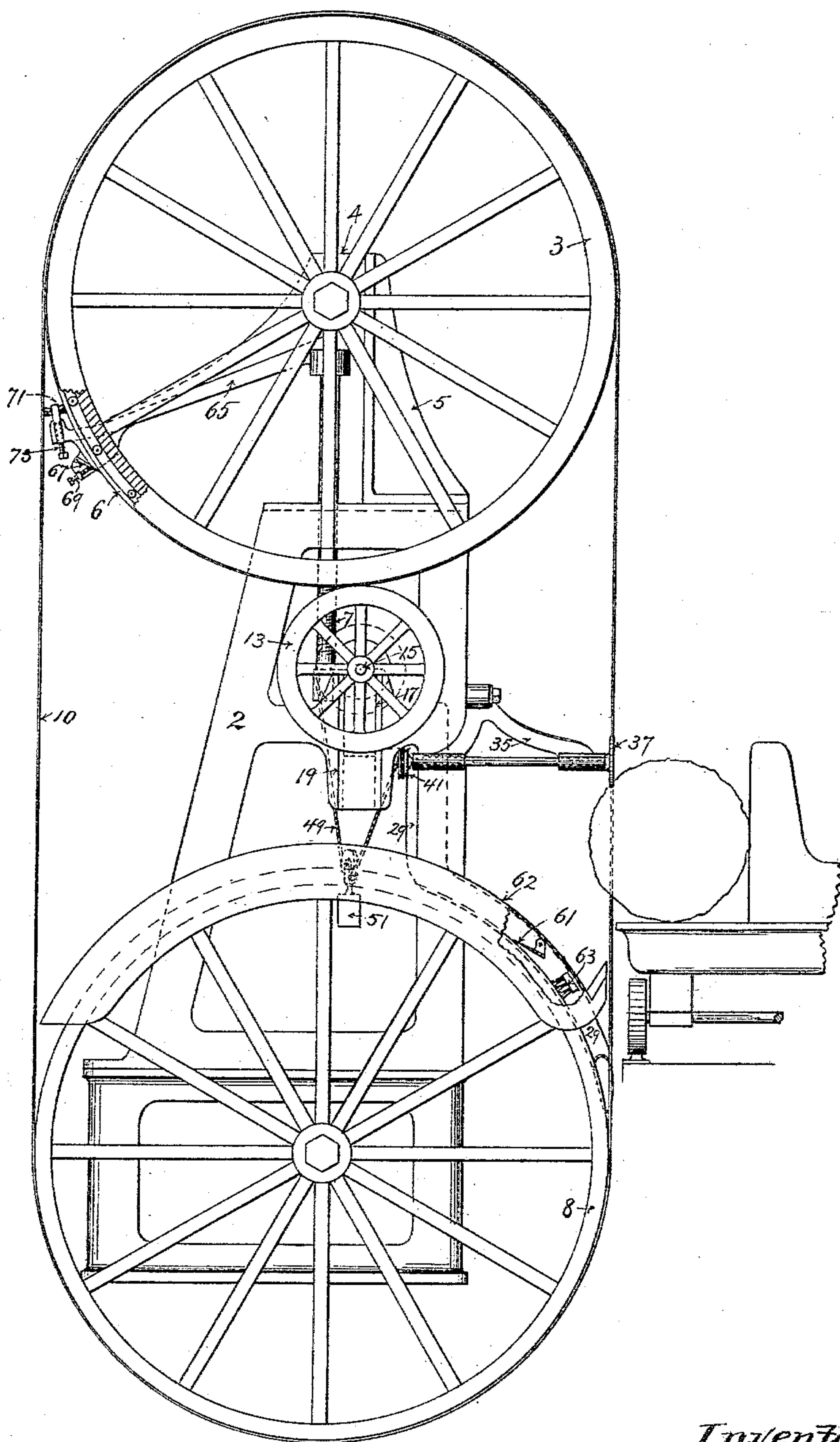
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C. ESPLIN.  
BAND SAW MILL.

No. 339,539.

Patented Apr. 6, 1886.

*Fig. 1.*



Witnesses  
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(No Model.)

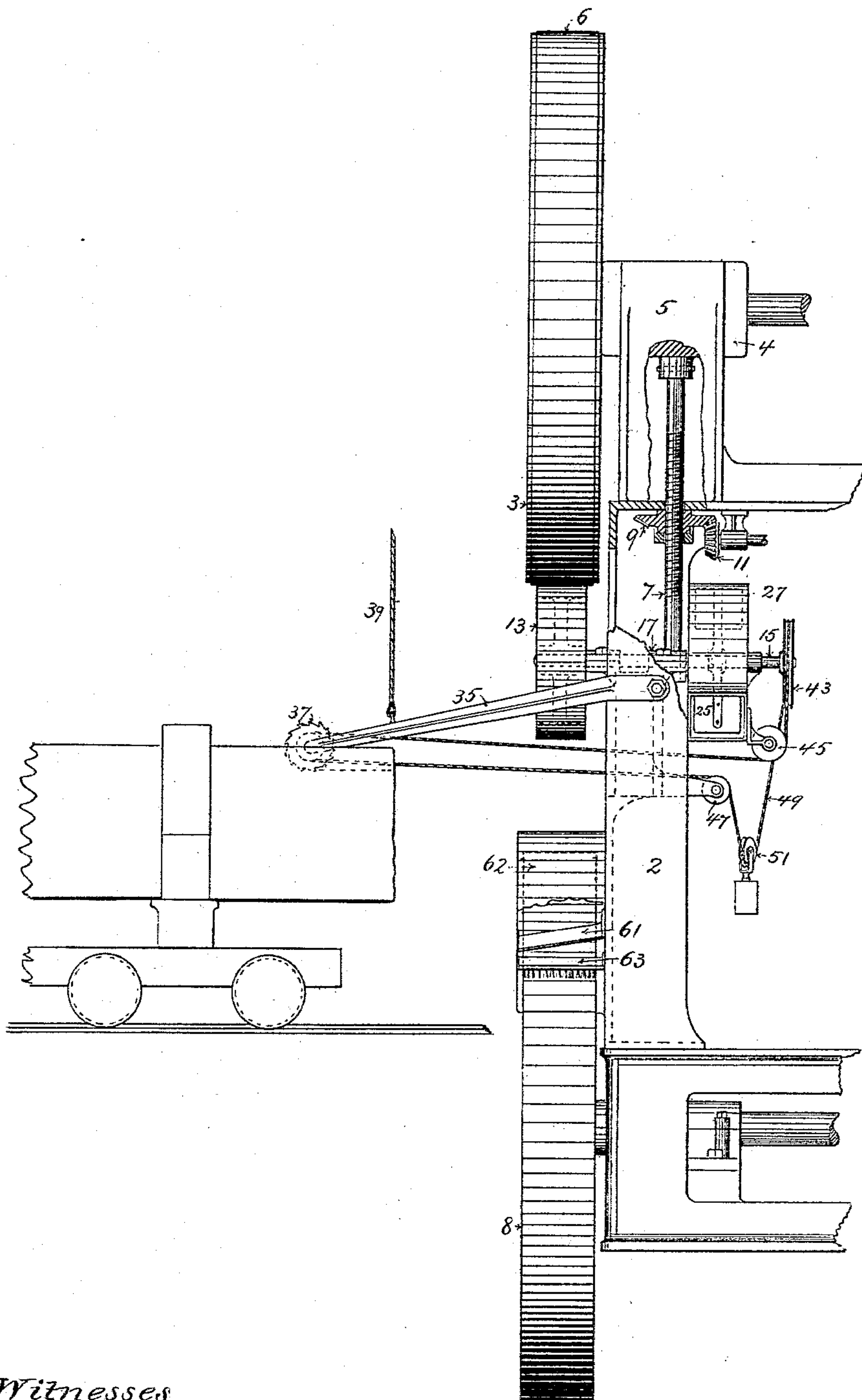
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*Fig. 2.*



Witnesses

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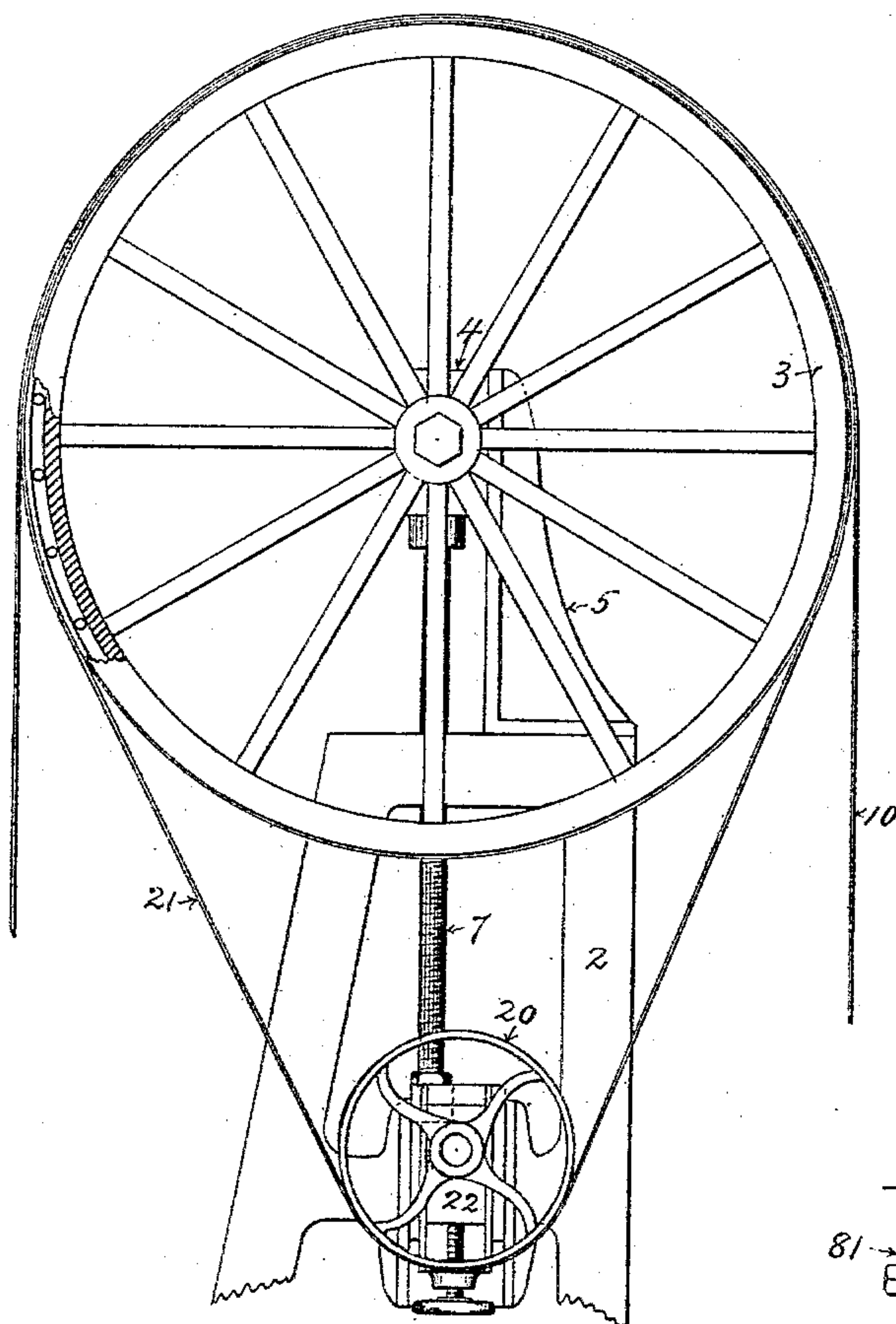
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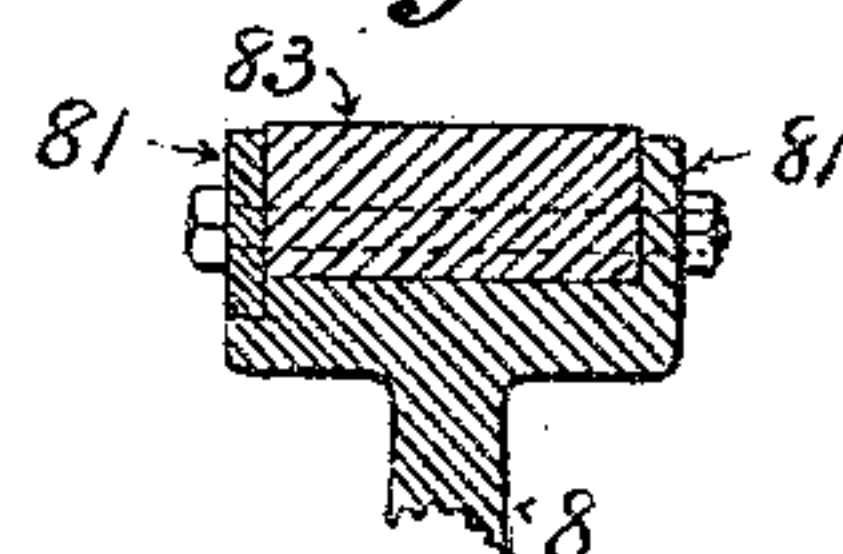
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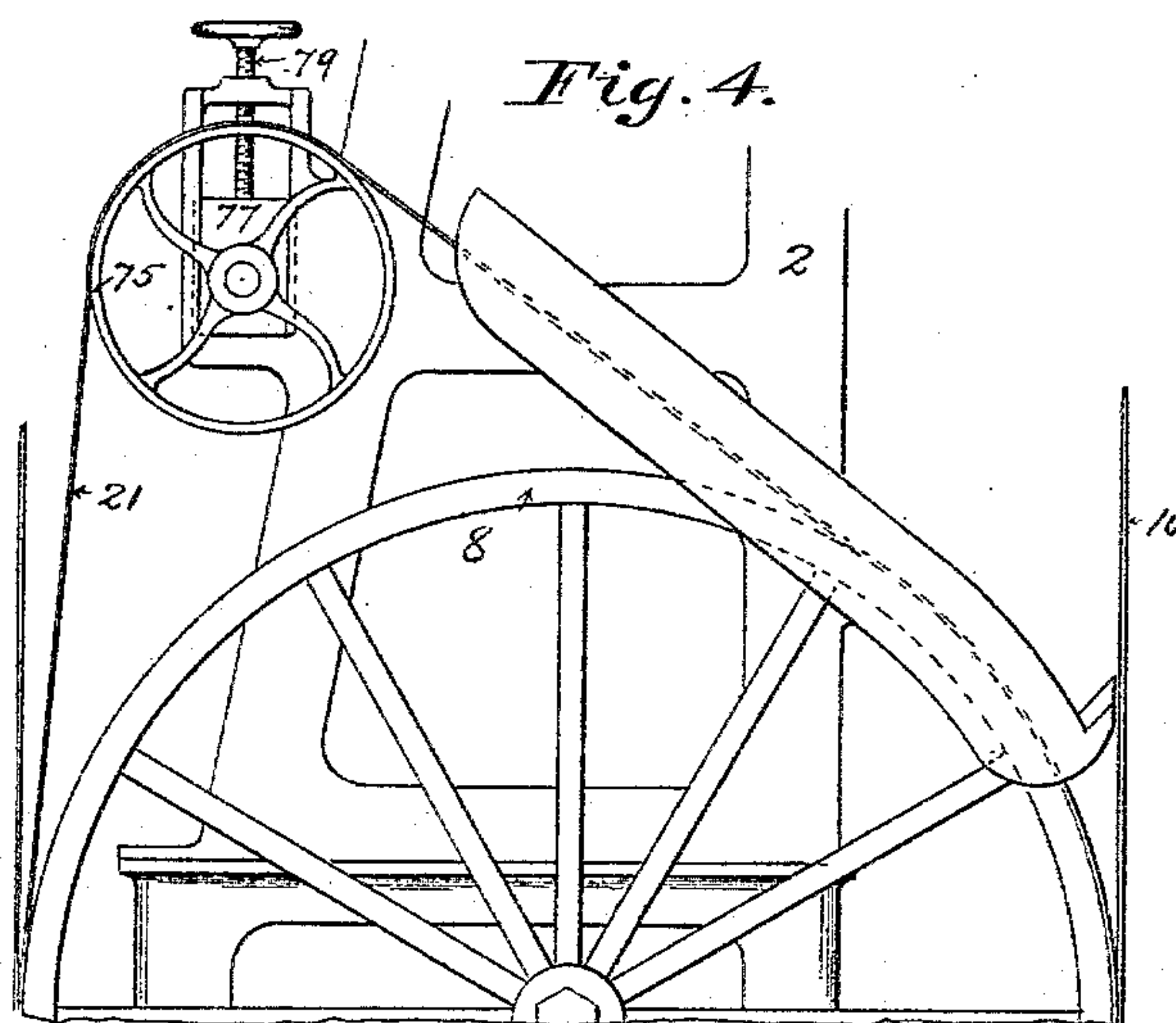
*Fig. 3.*



*Fig. 5.*



*Fig. 4.*



*Witnesses*

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# UNITED STATES PATENT OFFICE.

CHARLES ESPLIN, OF MINNEAPOLIS, MINNESOTA, ASSIGNOR OF ONE-HALF  
TO THE PRAY MANUFACTURING COMPANY, OF SAME PLACE.

## BAND-SAW MILL.

SPECIFICATION forming part of Letters Patent No. 339,539, dated April 6, 1886.

Application filed February 5, 1886. Serial No. 190,886. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES ESPLIN, of Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain Improvements in Band Sawing-Machines, of which the following is a specification.

The object of the present invention is to provide a device that may be applied to the rim of the upper wheel of a band sawing-machine to retard its momentum, and also to utilize the power transmitted from said wheel to said retarding device to drive one or more appliances of the machine.

To the above end my invention consists, generally, in the construction and combination hereinafter described, and particularly pointed out in the claims.

In the accompanying drawings, forming part of this specification, Figure 1 is a front elevation of a band sawing-machine embodying my invention. Fig. 2 is a sectional side elevation. Fig. 3 is a partial front elevation showing a modification. Fig. 4 is a partial front elevation of the lower wheel, and Fig. 5 a section of the rim thereof.

As band sawing-machines are generally constructed the upper wheel is a loose wheel that supports the upper part of the saw. This wheel is usually large and heavy, and it acquires considerable momentum, thereby acting as a powerful fly-wheel, and throwing the slack of the saw to its working side with injurious results to the work.

In an application now pending before the Patent Office I have described an upper wheel having an independent rim, within which the wheel itself is free to revolve, the object of the construction being to overcome the above-mentioned objection. The independent rim of this upper wheel acquires sufficient momentum of itself to tend to carry over the slack of the saw to its working side when the saw enters the cut. I provide a device that operates as a friction-brake on this independent rim, and also, being driven from the rim, serves to drive a blower, rosser, or other appliance of the machine.

In the drawings, 2 represents the frame of the band sawing-machine, upon the top of which is supported the wheel 3. This wheel is preferably constructed with an independent

rim, 6, within which the wheel is free to turn, as described in my application, to which reference is hereinbefore made. The shaft of the wheel 3 is mounted in a suitable pillow-block, 4, that slides vertically on the bracket 5. A screw, 7, is preferably secured at its upper end to the pillow-block, and passes through a threaded opening in a bevel-gear, 9, that is held between suitable lugs or projections on the frame of the machine. This gear is rotated by means of a suitable pinion, 11, and thereby the pillow-block and wheel are vertically adjusted. A friction-wheel, 13, is mounted within the band-saw, beneath the upper wheel, in contact with its rim. The shaft 15 of the wheel 13 is journaled in suitable boxes on a slide, 17, that is free to move vertically in suitable ways, 19. The lower end of the screw 7 is attached to this slide, and the friction-wheel and the upper wheel are thereby simultaneously adjusted without altering their relative positions. This friction-wheel acts as a brake upon the independent rim of the upper wheel, thereby aiding in overcoming its momentum and preventing the carrying over of the slack in the saw to its cutting side. The rim of the upper wheel is preferably provided with a band, 21, composed of felt, rubber, leather, or other suitable material. This band may be arranged as shown in Fig. 1, fitting closely over the rim, in which case the friction-wheel is in contact with its outer surface; or its length may be greater than the circumference of the wheel, in which case the band extends around an ordinary pulley, 20, located below the upper wheel within the saw, and mounted upon a slide similar to that described for supporting the friction-wheel. This slide is connected to the pillow-block 4 by the screw 7, as described above, and it has preferably a second slide, 22, that carries the shaft of the pulley, and that may be independently adjusted to regulate the tension of the band 21. The second slide may be dispensed with, and the tension of the band regulated by adjusting the slide 17 on the screw 7 by means of adjusting-nuts. The pulley 20, being driven by the rim of the upper wheel through the band 21, operates similarly to the friction-wheel to retard the momentum of the rim.



There are some advantages in the band arranged as shown in Fig. 3 over the other arrangement—as, for instance, the band acts as a cushion for the saw in the same manner as if it were attached rigidly to the upper wheel. It presents a larger amount of wearing-surface, and when worn out it is more easily replaced, and it also acts as an independent guide for the saw to lead it to any desired portion of the wheel.

By the use of the retarding-wheel, either in the form of a friction-wheel bearing against the rim or a pulley with the flexible band of the rim passing around it, I am enabled to prevent the momentum acquired by the upper wheel from acting to carry over the slack of the saw to its cutting side, and by connecting this retarding-wheel, of either form, with an appliance of the machine, I am enabled to use to advantage power that is unavoidably acquired by the upper wheel, and has heretofore been a disadvantage and injuriously affected the operation of the machine. I prefer to utilize this retarding wheel or pulley to drive one or more appliances of the machine, and in Figs. 1 and 2 I have shown a fan for removing sawdust and a rosser, both driven from the retarding-wheel.

Upon the shaft 15 of the wheel 13, at the opposite side of the slide, is a fan-wheel, 25, within a casing, 27, that is supported on the slide. From this casing a pipe, 29, extends below the cutting-point of the saw. The mouth of the pipe is preferably shaped to correspond to the space between the saw and the wheel. The fan operates to remove the sawdust, either by blast or suction, and prevents its getting between the saw and wheel.

In Figs. 1 and 2 I have shown a rosser for cutting the bark of the log and leading the band-saw. This rosser consists of a small circular saw or cutter mounted upon a shaft that is carried in the end of a swinging frame, so that the rosser is free to rise or fall to accommodate itself to the inequalities of the log or to logs of different sizes. As the band-saw is very thin, the fibrous portion of the bark often turns the saw and causes it to make a crooked cut. Moreover, in cutting a round log, one side of the saw enters first, and there is therefore a tendency to throw the saw out of line. The rosser removes the bark and makes a path for the thin band-saw.

The construction that I have shown and prefer to use is as follows: Pivoted to the frame of the machine is an arm, 35, that extends in front of the band-saw and carries at its forward end a rosser, 37. A cord, 39, is attached to this arm for the purpose of raising or lowering it. The shaft of the rosser is provided with a suitable pulley, 41. A pulley, 43, is mounted on the end of the shaft that carries the friction-wheel. Idler-pulleys 45 47 are mounted on the frame of the machine, and a belt, 49, passes around the pulley 41, under one idler and over the other, and around the pulley on the rosser-shaft. A weighted tight-

ener-pulley, 51, is hung on the belt between the idler and the pulley 41, and serves to regulate the tension of the belt as the rosser and guide are raised or lowered.

I prefer to provide devices, in connection with the upper and lower wheels of the machine, that will remove the sawdust that adheres to the surfaces of the wheels and to the inner surface of the saw. Sawdust falling from the cut gets between the saw and the surface of the lower wheel, and, being carried around with the wheel and saw, adheres to the surface of the wheel and to the inner surface of the saw. That which adheres to the saw is carried up over the upper wheel, and some of it becoming detached adheres to the surface of the upper wheel. The sawdust on the wheels forms lumps or bunches thereon, and by these the saw will often be unequally stretched or buckled.

I provide devices for removing the adhering sawdust from the wheels, and also from the saw.

In Figs. 1 and 2, 61 represents a scraper, composed, preferably, of metal, and secured, preferably, by a hinge or pivot to the shield 62, that covers the lower wheel; or this scraper may be secured to any other suitable part of the frame of the machine. The scraper is preferably arranged diagonally across the rim of the wheel, and preferably as close as possible to the point where the saw comes in contact with the wheel. The scraper loosens up the adhering sawdust, and takes it off the wheel. I prefer to provide a brush, 63, between the scraper and the saw, that bears on the surface of the wheel and brushes off any dirt or sawdust that may pass the scraper. This brush is also secured to the shield or to the frame of the machine.

To the pillow-block of the upper wheel I prefer to secure an arm, 65, that extends to the periphery of the wheel, and has hinged to it a scraper, 67, similar to the scraper 61. A set-screw, 69, may be provided to bear on the scraper and regulate its contact with the wheel. The arm 65 is also shown forming a support for a brush, 71. This brush is preferably double, and located in the angle between the saw and wheel. This brush bears on the surface of the wheel, and also on the inner surface of the saw.

Suitable adjusting means, as a set-screw, 73, is provided by means of which the position of the brush may be regulated.

Separate brushes may be used for the wheel and saw, if preferred.

The brush and scraper may be used together, or either may be used separately.

It is desirable to provide a covering of some flexible material for the band-saw wheels, to protect the rim in case it is of wood, and to protect the teeth of the saw in case the rim is of iron. When the covering or band is of the same diameter as the wheel, and attached rigidly thereto, it is liable to become stretched when in use by being gripped between the



saw and the wheel, and particularly (in the case of the lower wheel) by any slip of the saw as it enters the cut. This causes the surface of the band in a short time to become crimped or puckered, and present an uneven surface for the saw to rest upon. The band is eventually loosened or stripped from the wheel with disastrous results to the saw.

I have herein described a band as applied to the upper wheel; but it can also be applied to the lower wheel with equally good results and for the same purpose, except that in the lower wheel, as no retarding device is required, the pulley over which the band passes may be simply an idler. A preferable arrangement of this device is shown in Fig. 4, in which the band 21 passes around the lower wheel, 8, between it and the saw 10, and over the tightener-pulley 75, that is located within the saw and journaled on the slide 77. This slide is operated by a screw, 79, and by this means any stretch of the band 21 may be taken up. The lower wheel, 8, may be constructed with flanges 81, (see Fig. 5,) one of which is loose, and between these flanges, and held rigidly thereto, with a solid ring or rim, 83, of compressed paper or other equivalent material. This rim may be used with the flexible covering of the same diameter, or with the band of larger diameter passing over an idler, as before described; or the band may be dispensed with, in which case the saw will come in direct contact with the paper rim. A rim of this character is hard and not liable to be destroyed by the saw; but it is sufficiently elastic to preserve the teeth of the saw from injury. This rim also prevents slip of the saw when it is in direct contact therewith.

The retarding wheel or pulley may also advantageously be applied to the rim of upper wheels of other constructions than those here shown, and it may be utilized to drive other appliances of the machine.

Other means may be used for transmitting power from the retarding-wheel to the fan or rosser. The fan may be attached to the frame of the machine, or may be placed entirely separate from the machine and driven by a belt from the shaft of the friction wheel or pulley.

The means for adjusting the upper wheel and the parts that co-operate with it may also be varied without departing from my invention.

Both friction wheel and pulley may be used together; but in practice either one will be found sufficient.

I do not claim the rosser itself as of my invention, the same being old and well known, but believe myself the first to apply the same to a band-saw mill; nor do I claim, broadly, a fan for removing sawdust, but only the particular application thereof and the combination set forth in a band-saw mill.

I claim as my invention—

1. In a band sawing-machine, the combination of an upper wheel, an independent rim within which said wheel is free to revolve, and

a friction-wheel located within the band-saw in contact with said rim, substantially as described, and for the purpose set forth. 70

2. The combination, in a band sawing-machine, with the saw and the upper wheel, of a friction-wheel located within the saw and in contact with the rim of said upper wheel, substantially as described, and for the purpose set forth. 75

3. The combination, in a band sawing-machine, of an upper wheel and an independent rim having a flexible band thereon, said wheel and rim turning independently of each other, and a retarding-wheel located within the saw in contact with said band, substantially as described, and for the purpose set forth. 80

4. The combination, in a band sawing-machine, with the saw and band-wheel, of a pulley journaled upon bearings within the band-saw, and a flexible band passing around said pulley and around said band-wheel, between the rim of the wheel and the saw, substantially as described, and for the purpose set forth. 85

5. The combination, in a band sawing-machine, with the saw and the upper wheel, of a retarding-wheel located within the saw and driven by said upper wheel, the fan 25, the fan-casing 27, the tube 29, extending from said casing to a point below the cutting portion of the saw, and driving means between said fan and said retarding-wheel, substantially as described, and for the purpose set forth. 90

6. The combination, in a band sawing-machine, with the saw and the upper wheel, of a retarding-wheel located within the saw and driven by said upper wheel, the rosser 37, mounted in the swinging arm 35, and driving mechanism between said rosser and said retarding-wheel, substantially as described, and for the purpose set forth. 100

7. The combination, in a band sawing-machine, with the saw and the upper wheel, of the friction-wheel located beneath said upper wheel in contact with the rim thereof, the fan 25, driving means between said fan and said friction-wheel, the fan-casing 27, and the tube 29, extending from said casing to a point below the cutting portion of said saw, substantially as described, and for the purpose set forth. 110

8. The combination, in a band sawing-machine, with the saw and the upper wheel, of the friction-wheel located within the saw in contact with the rim of said upper wheel, the rosser 37, mounted in the swinging arm 35, and driving means between said rosser and said friction-wheel, substantially as described, and for the purpose set forth. 115

9. The combination, in a band sawing-machine, of the upper wheel, the sliding pillow-block on which said wheel is mounted, a retarding-wheel located beneath said upper wheel and rotated thereby, the slide carrying said retarding-wheel, the screw secured to said pillow-block and to said slide, and the adjusting-nut on said screw, whereby said upper wheel and said retarding-wheel may be moved 120

125



vertically without changing their relative adjustment, substantially as described.

10. The combination, in a band sawing-machine, with the saw and band-wheel, of a scraper arranged within the saw and bearing on the rim of the wheel, substantially as described, and for the purpose set forth.

11. The combination, in a band sawing-machine, with the band-saw and wheel, of a brush secured to the frame of the machine and bearing on the rim of the wheel within the band-saw, substantially as described, and for the purpose set forth.

12. The combination, in a band sawing-machine, with the band-saw and the lower wheel, of the upper wheel, a sliding pillow-block on which said wheel is mounted, an arm secured to said pillow-block and extending to the rim of the wheel, and a scraper mounted on said arm and bearing on the rim of the wheel, substantially as described, and for the purpose set forth.

13. The combination, in a band sawing-machine, with the band-saw and the lower wheel, of the upper wheel, a sliding pillow-block on which said wheel is mounted, an arm secured to said pillow-block and extending to the rim of the wheel, and a brush mounted on said arm and bearing on the rim of the wheel, substantially as described.

14. The combination, in a band sawing-machine, with the saw and the upper wheel, of the double brush arranged in the angle between the saw and wheel, and bearing on the rim of the wheel and on the inner surface of the saw, and means for adjusting said brush, substantially as described.

In testimony whereof I have hereunto set my hand this 28th day of January, 1886.

CHARLES ESPLIN.

In presence of—

JAMES PYE,

A. F. PRAY.