No. 784,409. PATENTED MAR. 7, 1905.

H. A. LITZ.

WOOD SAWING MACHINE.

APPLICATION FILED OCT. 26, 1904.

3 SHEETS—SHEET 1.

Fig. 1.

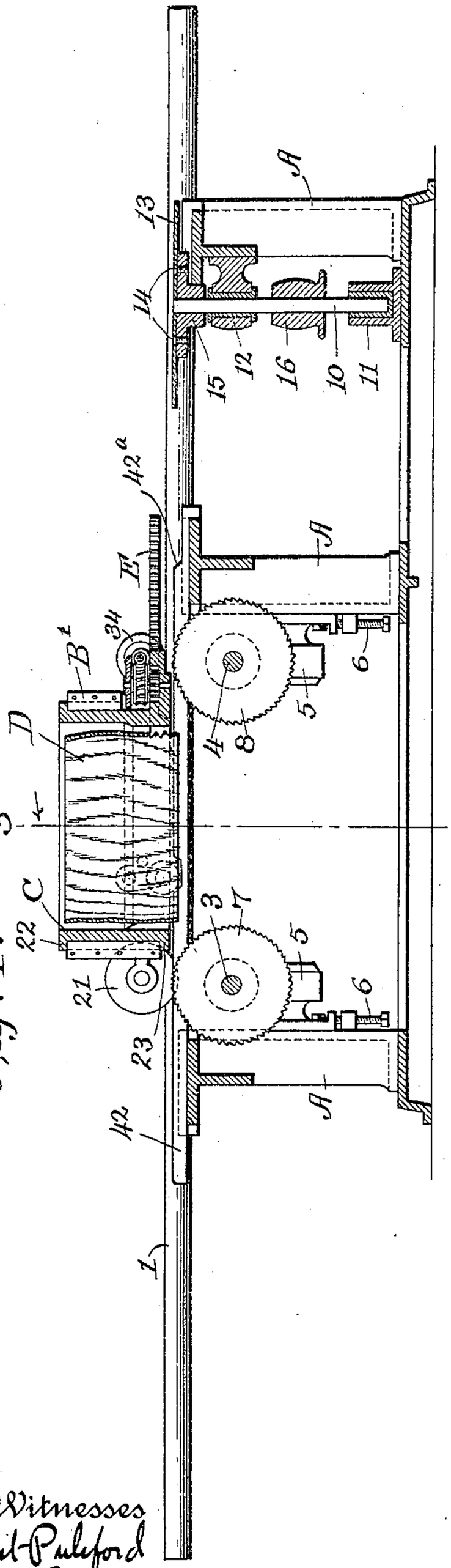
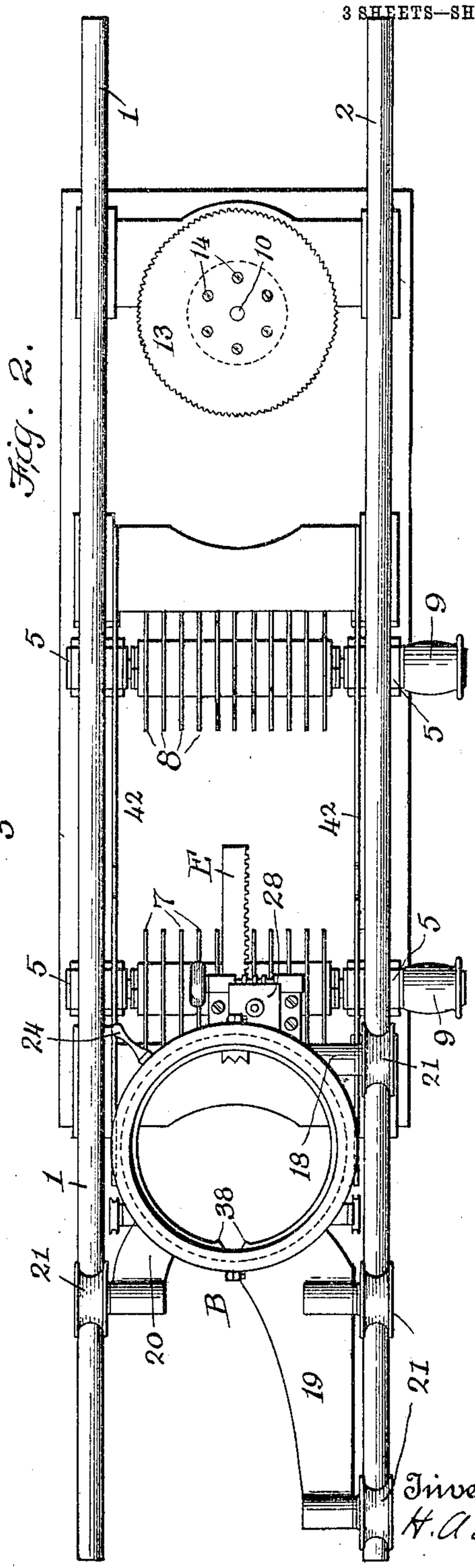


Fig. 2.



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3 SHEETS—SHEET 2.

Fig. 3.

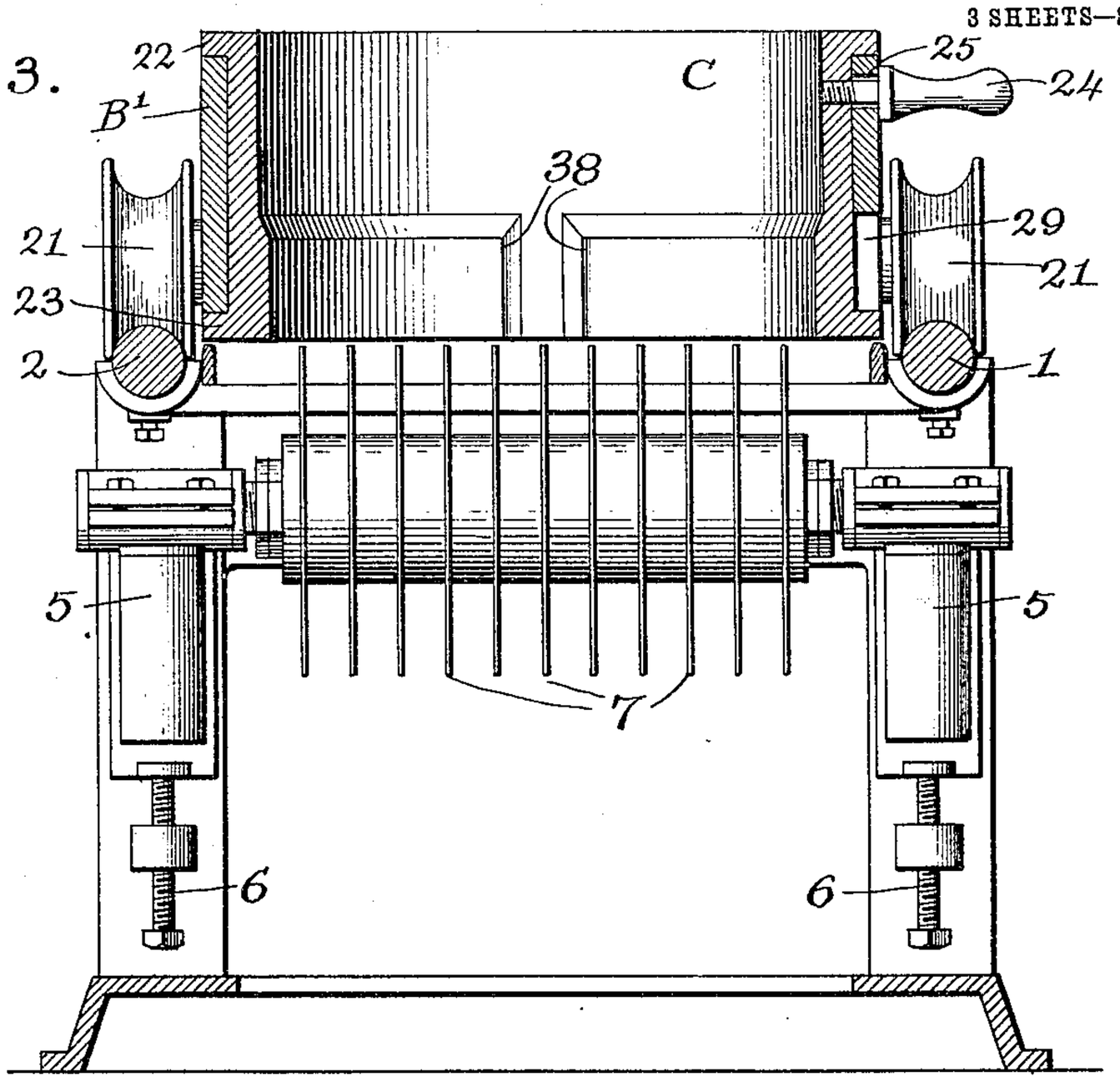
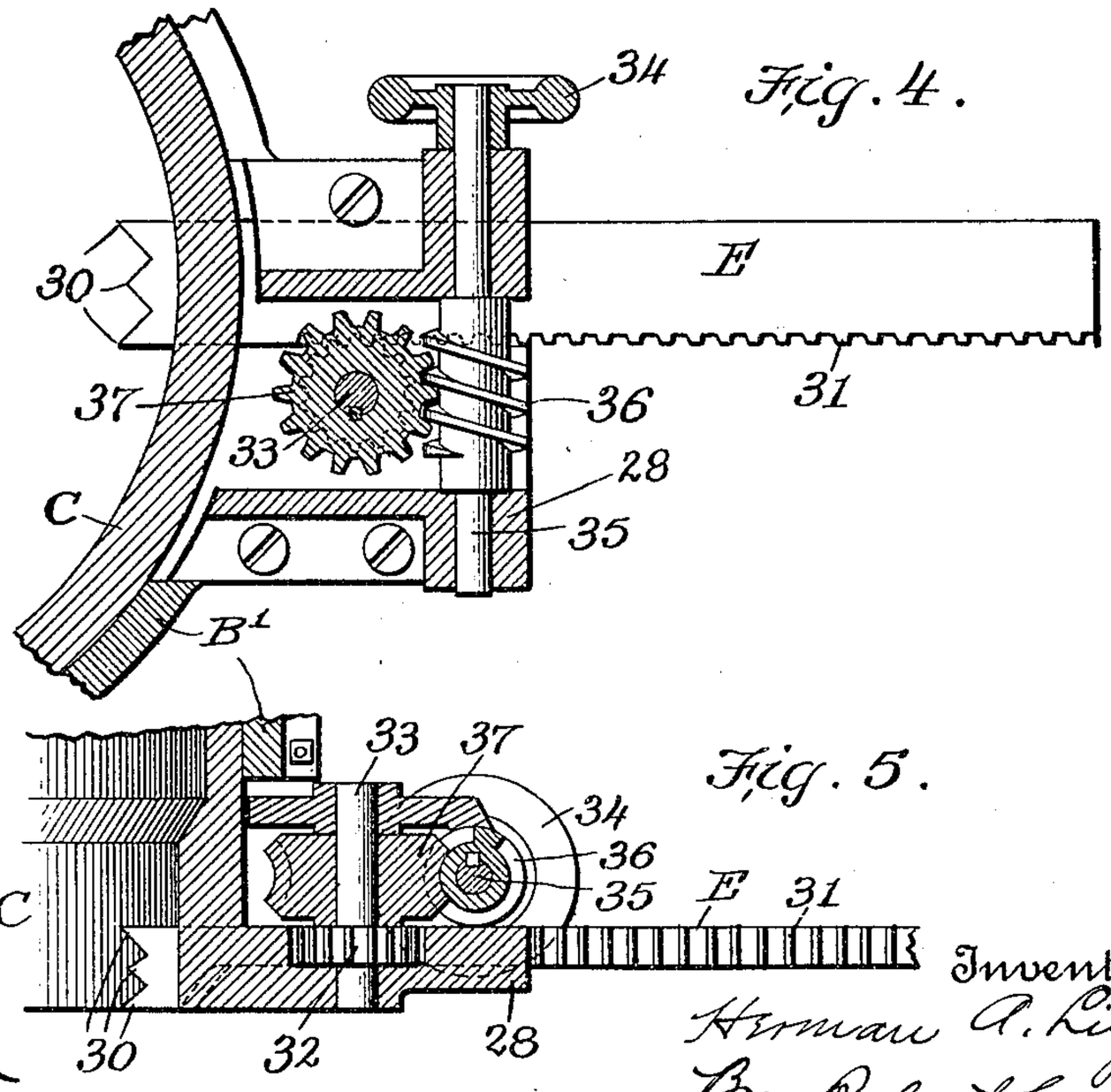


Fig. 4.



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3 SHEETS—SHEET 3.

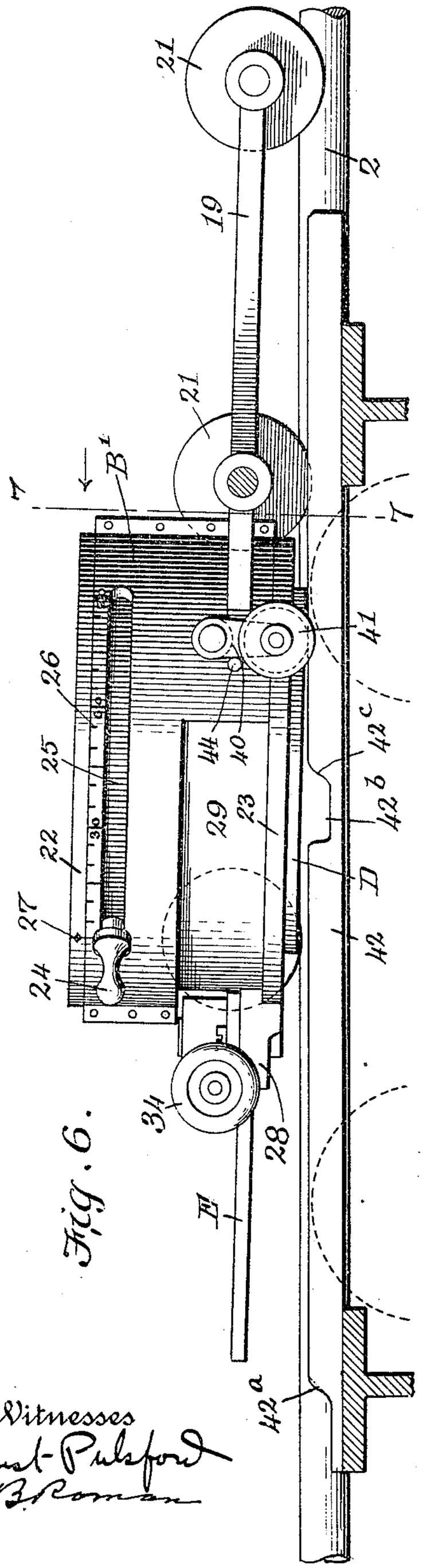

Fig. 6.

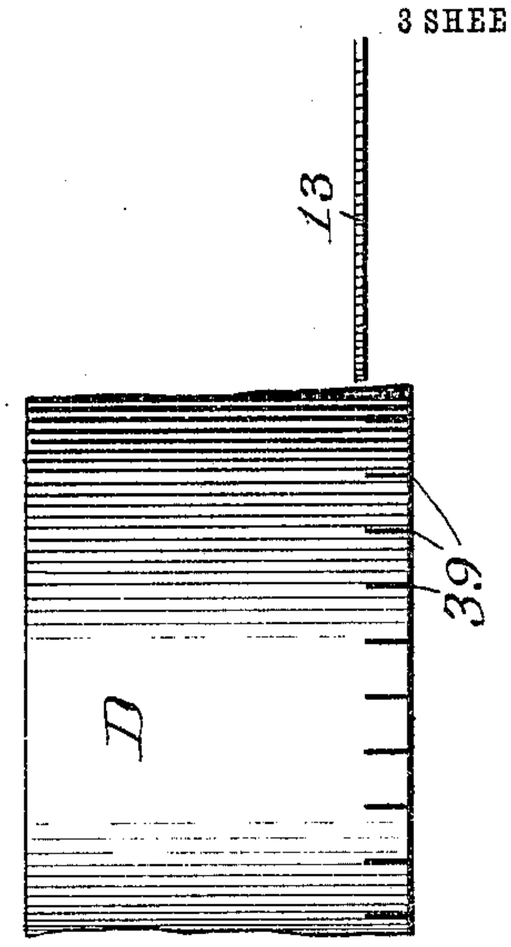

Fig. 8.

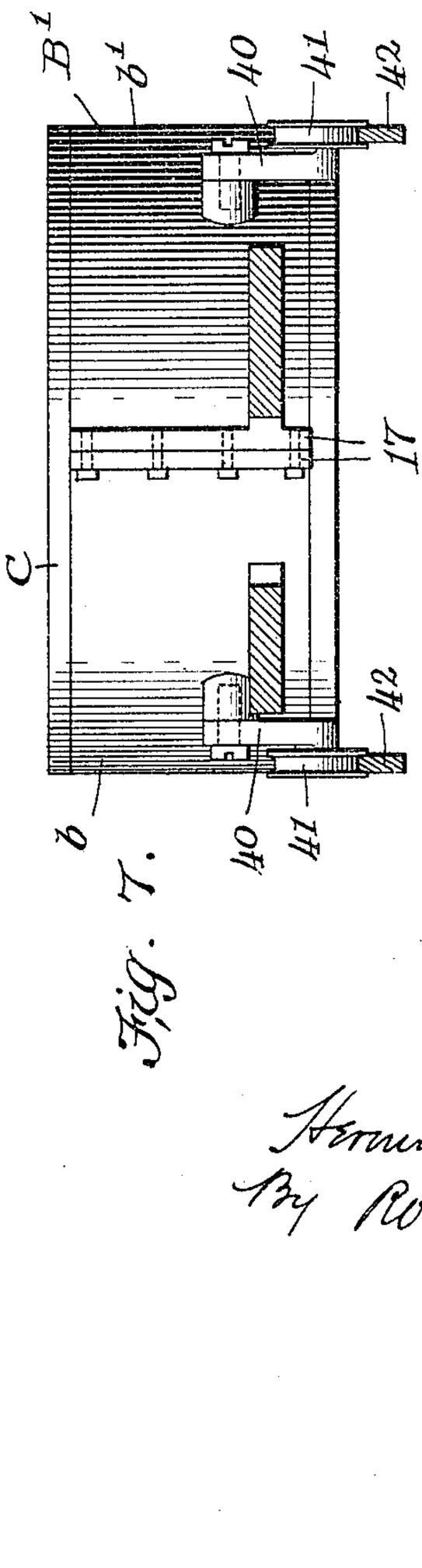

Fig. 7.

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UNITED STATES PATENT OFFICE.

HERMAN A. LITZ, OF DANVILLE, PENNSYLVANIA.

WOOD-SAWING MACHINE.

SPECIFICATION forming part of Letters Patent No. 784,409, dated March 7, 1905.

Application filed October 26, 1904. Serial No. 230,052.

To all whom it may concern:

Be it known that I, HERMAN A. LITZ, a citizen of Switzerland, residing at Danville, in the county of Montour and State of Pennsylvania, have invented certain new and useful Improvements in Wood-Sawing Machines, of which the following is a specification.

The purpose of my invention is to provide a wood-sawing machine adapted by successive operations to cut out blocks suitable for mosaic or inlaid work of various shapes from a large block or log of wood.

In carrying out my invention I provide one or more gangs of parallel scoring-saws and a holder arranged to hold a block or log of wood with the face to be operated upon in position to be scored by the saws, said holder having a feeding movement relatively to the saws in order that the block may be scored or grooved in straight parallel lines and also having an angular movement relatively to the saws in order that the log or work may be scored with straight intersecting grooves in two or more directions by the saws, and I also provide a saw which is arranged to sever the log parallel with its face at the bases of the slots or grooves in order to sever the blocks from the log or stock.

The details and mode of operation of my invention will be clear from the following specification, taken in connection with the accompanying drawings, in which—

Figure 1 is a central longitudinal vertical section through my improved machine. Fig. 2 is a top plan view of the machine. Fig. 3 is a section on the line 3 3 of Fig. 1. Figs. 4 and 5 are detail sectional views showing the mechanism for operating the dog which holds the work or log in the work-holder. Fig. 6 is a side view of the carriage which supports the work-holder and the rails which guide the carriage. Fig. 7 is a section on the line 7 7 of Fig. 6, and Fig. 8 is a side view representing a log which has been grooved by the scoring-saws and showing the position of the cutting-off saw relatively to the bottoms or bases of the grooves in the log or work.

Referring to the drawings, A indicates a suitable machine-frame, upon which are arranged two long parallel guide-rails 1 and 2. A pair of saw arbors or shafts 3 and 4 are arranged at right angles to the guide-rails 1 and 2 and below said guide-rails in suitable bearings 5, which are vertically adjustable by means of adjusting-screws 6. The saw-arbor 3 carries a set or gang of parallel saws 7, and the saw-arbor 4 carries a gang of parallel saws 8. These saws are driven by belts applied to pulleys 9 upon the ends of said shafts.

At the rear or right-hand end of the machine in Figs. 1 and 2 is arranged a vertical saw shaft or arbor 10, mounted in suitable bearings 11 and 12 and carrying at its upper end a saw 13. This saw is secured to a disk 15, which latter is secured to the shaft 10. The saw arbor or shaft 10 is provided with a pulley 16, by which it may be driven. Normally the gangs of saws 7 and 8 are adjusted to the same height with relation to the top of the guide-rails, and the horizontal or cutting-off saw 13 is arranged so that its under side will be substantially tangential to the peripheries of the saws.

Upon the rails 1 and 2 is arranged a carriage B, consisting, as shown, of two semitubular parts *b* and *b'*, having flanges 17, by means of which the two parts are bolted together to form a complete ring or supporting-collar B', and having arms 18, 19, and 20, projecting laterally therefrom and provided with grooved guide-pulleys 21, which rest upon the guide-rails 1 and 2 and support and guide the carriage. As shown, the carriage is provided with three guide-pulleys at one side, arranged at some distance apart upon the guide-rail 2 in order to provide a long bearing upon the rail which will prevent lateral or side motion of the carriage. A single guide-wheel carried by the arm 20 and resting on the guide-rail 1 is sufficient to support the carriage upon that rail.

Within the supporting ring or collar B' is arranged an annular work-holder C, having flanges 22 and 23 at the top and bottom, respectively, which project over the ends of the collar B'. This work-holder may be rotated or turned freely within the supporting-collar B' by means of a handle 24, secured to the wall of the work-holder and projecting through a slot 25 in the wall of the supporting-collar B'. The flanges

22 and 23 prevent any longitudinal movement of the work-holder within the supporting-collar. A scale 26 is arranged upon the supporting-collar parallel with the slot 25, and an index-mark 27 is arranged upon the flange 22 of the work-holder adjacent to said scale. By moving the handle 24 it will be seen that the work-holder and the work held therein may be adjusted angularly with reference to the planes of the gangs of saws, and by means of the scale the operator may arrange the work at any desired angle to the saws. The work-holder C, which is vertically arranged, is adapted to receive a section D of a log, and the log or stock is held tightly within the work-holder by means of a dog E, consisting of a straight rack-bar, which is supported upon a bracket 28, projecting from the lower part of the work-holder through a slot 29 in the wall of the supporting-ring B′, said bar extending radially through a slot in the wall of the work-holder near its lower end. This dog is provided with pikes or teeth 30 at its inner end, which are adapted to engage the log or work, and it is provided with teeth 31 along one of its lateral edges, which are engaged by a pinion 32, secured upon a shaft 33, which latter is journaled in the bracket 28. The pinion 32 may be rotated to move the dog into and out of engagement with the log by means of a hand-wheel 34 upon a worm-shaft 35, which carries a worm 36, engaging a worm-wheel 37, secured to the shaft 33. The dog may be forced inward with very heavy pressure by means of the mechanism described, and the interior of the work-holder is provided with suitable points or projections 38 at the side opposite the dog, which will indent the log and hold the latter firmly when the dog is forced inward.

In the operation of the machine thus far described a cylindrical section D of a seasoned log is arranged within the work-holder and gripped by the dog E. The log or work is sawed off so that its lower face will be flat before it is inserted in the holder, and the log is held within the work-holder with its lower face at right angles to the planes of the gangs of saws and in position to engage the saws when the carriage is moved forward upon the guide-rails. The carriage is arranged at the left of the machine in Figs. 1 and 2, when the work is first placed in the work-holder, and the carriage is then moved toward the rear or right-hand side of the machine past the first gang of saws 7, which, it will be seen, will score or groove the lower end of the log or work to a uniform depth. If it is desired to make square or rectangular blocks, the work-holder is turned through an angle of ninety degrees after the holder has passed the first gang of saws and before it is engaged by the second gang. In other words, when the work-holder reaches the position shown in Fig. 1 it is turned ninety degrees by moving the handle 24. If the blocks are to be square, the saws 8 will be equal in number and in the same planes as the saws 7, and when the holder, after turning angularly ninety degrees is moved again to the right past the gang of saws 8 it will be seen that the lower end of the log or work will be scored or grooved in straight lines at right angles to one another. After passing the second gang of saws the work is brought into contact with the cutting-off saw 13, which in Fig. 1 has its lower face arranged tangential to the gangs of scoring-saws, so that, as will be seen from Fig. 8, the cutting-off saw will cut into the solid block or log immediately above the bases of the grooves, the horizontal slot, however, intersecting the grooves sufficiently to sever the blocks or extending through the log so close to the bases of the slots as to leave the blocks connected only by thin webs of material. If it is desired to make rectangular blocks instead of square ones, it will be seen that it is only necessary to remove some of the saws from one of the gangs. For instance, if it is desired to make oblong blocks one inch by two inches square the saws 7 may be arranged one inch apart and the saws 8 two inches apart, and by moving the work-holder past the two gangs of saws, turning the holder ninety degrees between the two gangs, oblong blocks of the size mentioned may be cut off, or the saws 7 may be set at a greater distance apart than the saws 8 with a like result. By turning the work-holder at different angles between the two gangs of saws blocks of various shapes may be formed.

In the operation above described the work is scored by two different gangs of saws in order to divide off the blocks. The machine is arranged, however, so that the work-holder may be scored in various directions by a single gang of saws or in various directions by two saw-gangs in which the saws are spaced at different distances apart. For these purposes I arrange upon the supporting-ring B of the carriage a pair of pivoted arms 40, carrying wheels 41, which trail upon return guide-rails 42 when the carriage is moving from the front to the rear end of the machine. These return guide-rails have at their rear ends cam-surfaces 42^a and at their central portions, between the gangs of saws, notches 42^b and cam-surfaces 42^c, similar to the cam-surfaces or inclines 42^a. When the carriage moves toward the rear of the machine, the trailing wheels 41 rest lightly upon the return guide-rails 42, and the carriage is supported by the main carriage-guide rails 1 and 2. When the carriage is returned, however, the trailing wheels 41, meeting either pair of the inclined faces 42^a or 42^c, are arrested in their movement, and trailer-arms 40 swing against stops 44 at the rear of said arms, and with the continued movement of the carriage forward the trailing wheels will ride over the

cam-surfaces 42ª and 42ᶜ onto the top of the return guide-rails and lift the carriage, as shown in Fig. 6, so that the work will clear the saws. The guide-wheels 21 on the arms 19 and 20 will hold the carriage in line upon the track when the rear guide-wheel on the arm 18 is lifted off the track. The arm 19 being long and heavy is not raised off the guide-track.

It will be seen that by providing means for returning the carriage past one or both of the gangs of saws the work may be scored as often as desired and in any direction by either gang.

The form of the work-holder may be varied to suit logs or work of various shapes; but I have shown it in the form of a ring in the drawings adapted to hold a cylindrical section of a tree with the grain extending vertically, so that the mosaic or inlaying blocks when cut off will also have the grain running at right angles to the faces of the blocks.

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

1. In a wood-sawing machine, the combination with a pair of parallel guide-rails, two gangs of scoring-saws arranged in parallel planes between said guide-rails, and a cutting-off saw arranged at the rear ends of said rails in a plane substantially tangential to the peripheries of both gangs of saws, of a carriage movable along said guide-rails and having a supporting-ring with its axis extending vertically, a rotatable tubular work-holder fitting within said ring and supported thereby, and means, connected with said tubular work-holder, for gripping the sides of a log or block.

2. In a wood-sawing machine, the combination with the machine-frame having carriage guide-rails, and scoring-saws arranged in planes parallel with said carriage guide-rails, of a work-holder having an angular movement relatively to the planes of the saws, a carriage movable upon said guide-rails and arranged to support the work-holder, and means for automatically lifting the work-holder so that the work will not engage the scoring-saws in one direction of movement of the carriage.

3. In a wood-sawing machine, the combination with the machine-frame having carriage guide-rails, scoring-saws arranged in planes parallel with said guide-rails, and a cutting-off saw arranged in a plane substantially tangential to the peripheries of said scoring-saws, of a work-holder having an angular movement relatively to the planes of the scoring-saws, a carriage movable upon said guide-rails and arranged to support the work-holder, and means for automatically lifting the work-holder so that the work will not engage the scoring-saws in one direction of movement of the carriage.

4. In a wood-sawing machine, the combination with a main frame having carriage guide-rails and scoring-saws arranged parallel with said rails, of a carriage movable upon said rails to feed the work to the saws, return guide-rails arranged parallel with said carriage guide-rails, a pair of trailers pivoted to the carriage and adapted to bear upon the return guide-rails and raise the carriage so that the work will clear the saws when the carriage is returned.

5. In a wood-sawing machine, the combination with carriage guide-rails and a series of scoring-saws arranged in planes parallel with said guide-rails, of a carriage movable along said guide-rails and having a tubular supporting-ring arranged with its axis extending vertically, a tubular work-holder arranged within said supporting-ring and rotatable therein, and means connected with said tubular work-holder for gripping the sides of a log.

6. In a wood-sawing machine, the combination with a frame having guide-rails thereon, and saws arranged between said guide-rails, of a carriage movable upon the guide-rails and having a tubular supporting ring or collar, a tubular work-holder arranged within said collar, a dog extending horizontally through the wall of the holder and adapted to engage the work, said dog being provided with a rack, a pinion engaging said rack, and worm-gearing arranged to operate said pinion.

In testimony whereof I affix my signature in presence of two witnesses.

HERMAN A. LITZ.

Witnesses:

F. O. HARTMAN,

WM. GRAY WILLIAMS.