No. 771,064. PATENTED SEPT. 27, 1904.

L. J. HANHART.

BAND SAW MILL.

APPLICATION FILED MAY 27, 1904.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.

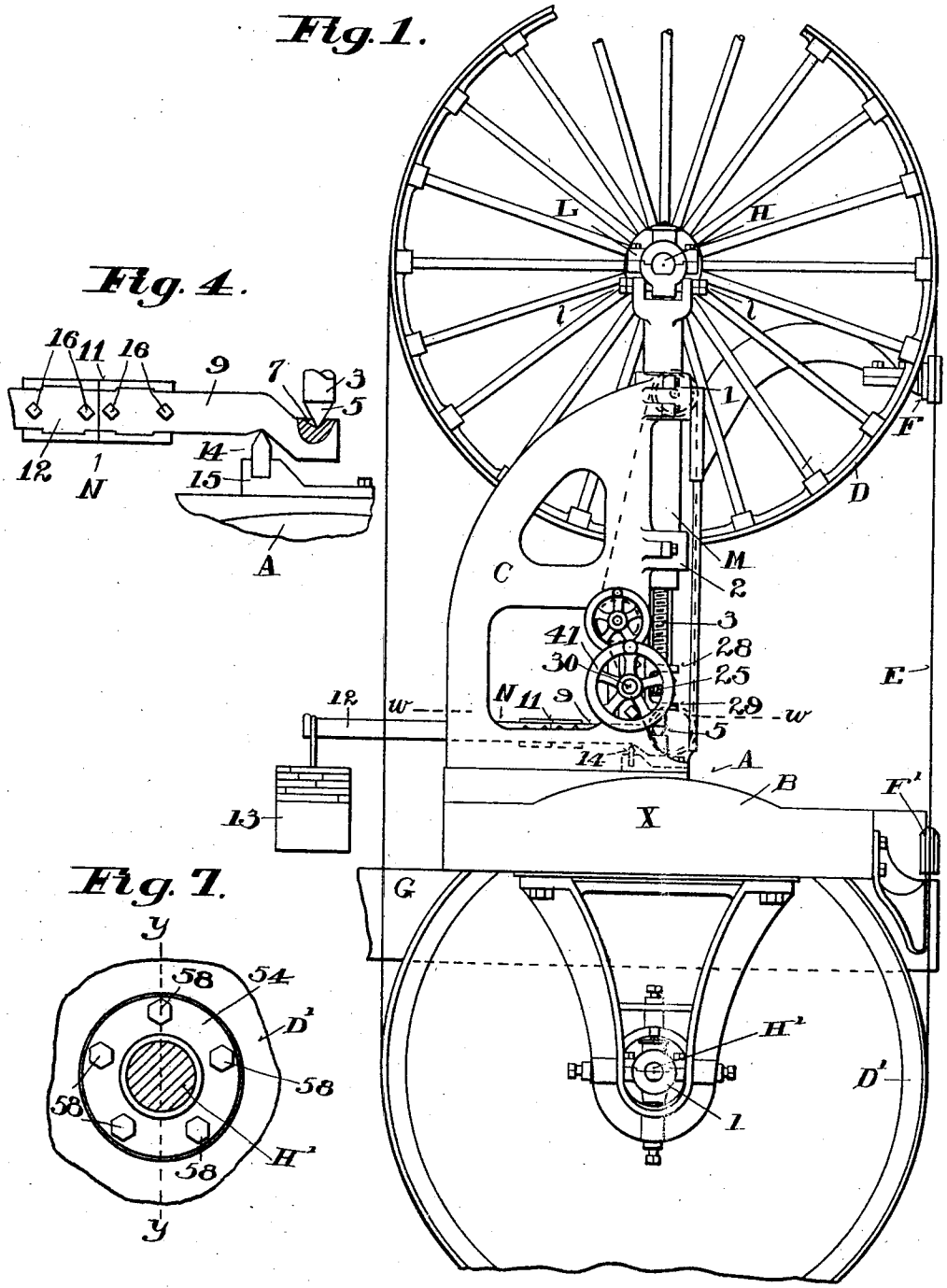

Fig. 4.

Fig. 7.

Witnesses:
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Roy Stevens

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NO MODEL. 2 SHEETS—SHEET 2.

Fig. 2.

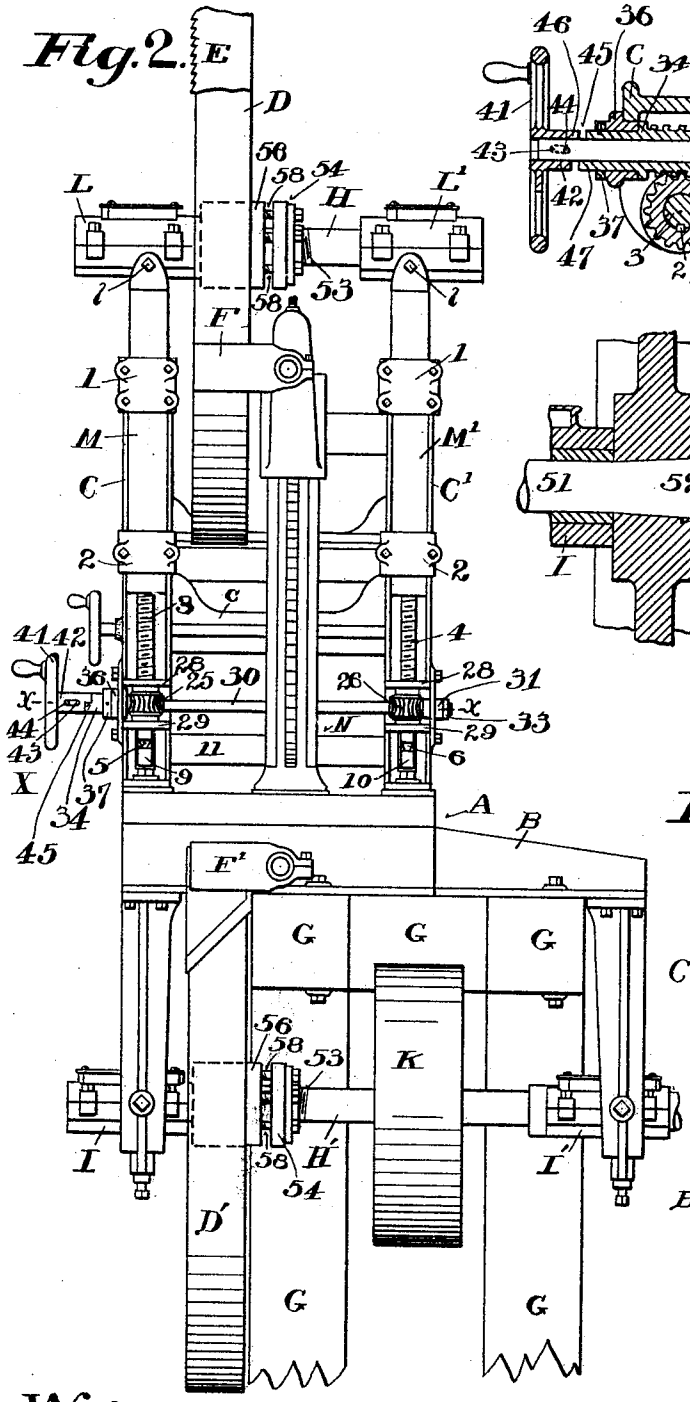


Fig. 5.

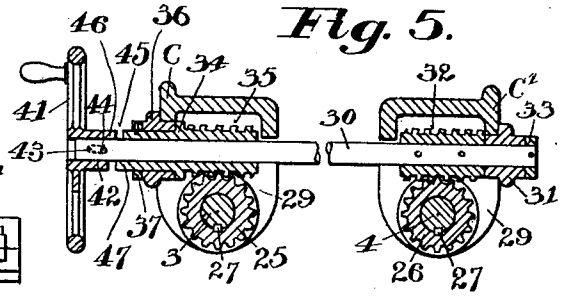


Fig. 6.

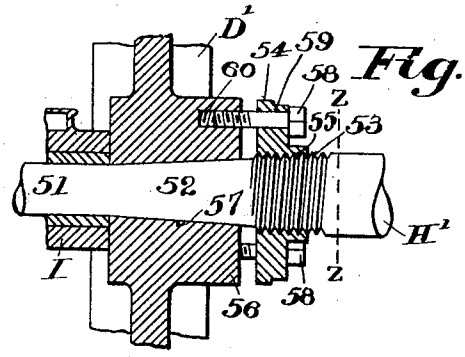
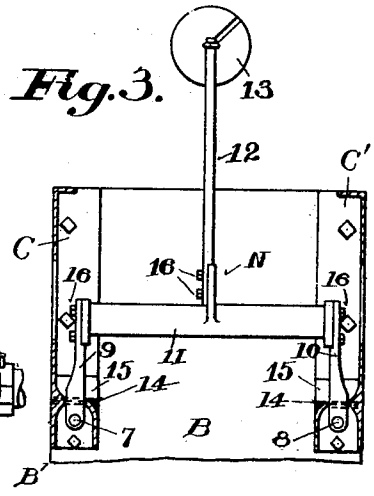


Fig. 3.



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No. 771,064. Patented September 27, 1904.

UNITED STATES PATENT OFFICE.

LOUIS J. HANHART, OF CINCINNATI, OHIO, ASSIGNOR TO J. A. FAY & EGAN COMPANY, OF CINCINNATI, OHIO, A CORPORATION OF WEST VIRGINIA.

BAND-SAW MILL.

SPECIFICATION forming part of Letters Patent No. 771,064, dated September 27, 1904.

Application filed May 27, 1904. Serial No. 210,097. (No model.)

To all whom it may concern:

Be it known that I, LOUIS J. HANHART, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Band-Saw Mills, of which the following is a specification.

It is the object of my invention to control the travel of the band-saw blade of a band-saw mill during operation solely by a single handle located at the sawyer's position, so that the same may be manipulated by the sawyer himself, this handle providing for the tipping and the straining action of the upper band-saw wheel. I preferably dispense with horizontal adjustment of the upper band-saw wheel during operation for "tracking" the blade, my improved construction permitting the sawyer without assistance or instructions to others and while performing his other duties to "track" and strain the saw-blade without such horizontal adjustment, thereby maintaining the saw-blade in the same vertical plane and avoiding the excessive side strain upon the upper saw-guide and the blade resulting from throwing the upper wheel laterally and out of vertical plane with the lower wheel and the saw-blade guides during operation.

It is the further object of my invention to secure the band-saw wheels upon their mandrels in improved manner so as to minimize the overhang of the band-saw wheels and frame. In band-saw mills the front bearings of the mandrels and the band-saw wheels overhang the supports of the mill, as illustrated by the location of the timbers in the drawings, this overhang being due to the fact that it is necessary to slip the band-saw blade, which is an unbroken or endless band, on and off the band-saw wheels. In order to bring the front bearings of the mandrels and the front of the frame as far rearwardly and as near the vertical plane of the foundation as possible, thereby providing minimum overhang and strain on the mill, I provide means at the rear of the band-saw wheels for securing the band-saw wheels and their respective mandrels together.

My invention will be readily understood from the following description and claims and from the drawings, in which—

Figure 1 is a front elevation of my improved device. Fig. 2 is a side elevation of the same. Fig. 3 is a plan view of the tension-lever supporting the upper saw-wheel slides, the columns being in section on the line *w w* of Fig. 1. Fig. 4 is a detail of the same in side elevation and partly broken away. Fig. 5 is a cross-section on the line *x x* of Fig. 2, partly broken away, showing the means for separately or simultaneously raising or lowering the bearings of the upper band-saw-wheel mandrel. Fig. 6 is a longitudinal sectional detail taken on the line *y y* of Fig. 7, showing the means for securing the band-saw wheel to its mandrel; and Fig. 7 is a cross-section of the same on the line *z z* of Fig. 6.

A represents the frame of the machine, comprising a base B and columns C C′, connected by a cross-brace *c*.

D is the upper band-saw wheel, D′ the lower band-saw wheel, and E the band-saw blade arranged to travel over these wheels.

F is the upper band-saw guide guiding the blade above the stock, (not shown,) and F′ is the lower band-saw guide guiding the blade below the stock.

The log-supporting carriage and feeding mechanism therefor are not shown.

The sawmill-frame is mounted upon suitable foundation G, consisting, preferably, of heavy timbers. The lower band-saw wheel is secured to a lower mandrel H′, and the upper band-saw wheel is secured to an upper mandrel H in manner hereinafter described. The lower saw-wheel mandrel is journaled in bearings I I′, suitably supported, said mandrel also supporting a driving-pulley K. The upper saw-wheel mandrel is journaled in bearings L L′, pivotally supported on bolts *l* at the upper ends of slides M M′, on which the bearings may be given a horizontal or lateral adjustment for bringing the upper band-saw wheel into position above the lower band-saw wheel for causing the cutting-strand of the saw-band to pass vertically between the wheels, the guides being positioned for guid-

ing the blade in that position. The slides M M′ slide in bearings 1 2 in the columns. The slides are supported on screw-rods 3 4, terminating, respectively, in points 5 6, resting in sockets 7 8 on arms 9 10 of a lever N, the lever being in the form of a yoked lever. The screw-rods are threaded into the lower ends of the slides. A connecting-web 11 connects the arms 9 10. A weighted arm 12, having weights 13 secured thereto, extends from the web 11. The said arms 9 10 are pivoted upon knife-edge bars 14, secured to a plate 15, secured to the base. The connecting-web of the yoke-lever is a casting, and each of the arms 9 10 12 is connected with the casting by being seated therein and secured in place by bolts 16. The screw-rods 3 4, respectively, have worm-wheels 25 26 splined thereto (see the key 27) for permitting the rods to move longitudinally therein while causing the worm-wheels and screw-rods to turn together, the worm-wheels being secured against endwise movement by being positioned between lugs 28 29 on the columns.

30 is a shaft. One end thereof is journaled in a bearing 31, bolted to the column C′ and has secured thereto a worm 32, meshing with the worm-wheel 26. It is secured against endwise movement by having one end of the worm take against one side of the bearing 31, a collar 33, secured to the shaft, taking against the other side of said bearing. At the other end of the shaft there is a sleeve 34 in which the shaft is journaled, on which sleeve there is a worm 35, meshing with the worm-wheel 25. This sleeve is journaled in a bearing 36, located on the column C. The worm 35 is secured against longitudinal movement by having one end thereof take against one side of bearing 36, a collar 37 being secured to the sleeve 34 and taking against the other side of said bearing. The shaft also carries an operating device or handle, shown as a hand-wheel 41, the hub 42 of which slides longitudinally on the shaft, but is secured thereto for causing the shaft to turn therewith, as by having a slot 43 in the hub, a pin 44 in the shaft taking into the slot. The hub and sleeve 34 are arranged to be caused to selectively turn together, as by having a tooth-clutch 45 between the same, the faces 46 of which are on the hub and the faces 47 of which are on the sleeve. If it is desired to tilt the upper band-saw wheel either backwardly or forwardly, the hub is slipped longitudinally on the shaft, disconnecting the clutch, the shaft turned in either direction, thereby turning the worm-wheel 26 and raising or lowering the slide M′ and tilting the upper band-saw wheel. If it is desired to simultaneously raise or lower both bearings of the upper band-saw wheel, the clutch 45 is engaged and the hub turned, thereby simultaneously turning both worm-wheels 25 26 and raising or lowering both bearings of the upper band-saw mandrel. In this manner simple means are provided for tilting the upper band-saw wheel, as well as tensioning the saw-blade for accommodating differences in strain on the blade during operation, the screws for the upper mandrel-bearing being selectively, separately, or simultaneously manipulated by simply clutching in or out and turned by a single hand-wheel located at the sawyer's position, (indicated by the letter X,) at the front of the band-mill. The tilting adjustment is required to be continually changed for accommodating the different thicknesses of the log or different thicknesses of the cut, different degrees of sharpness of saw, different speeds of travel of the carriage and other variations and in my improved construction is continually under direct control of the sawyer, and the sawyer having but a single hand-wheel to operate for throwing the clutch into or out of operation, as well as for adjusting one or both of the uprights, can give his undivided attention to the manner in which the blade runs while making his adjustments after he has once grasped the hand-wheel, for he can then shift the clutch in or out and turn one or both screw-rods in either direction without manipulation of other parts distracting his attention from the saw-blade.

For minimizing overhang of the front part of the band-saw-wheel frame I have provided the following novel means for securing the band-saw wheels to their mandrels. Each of the mandrels has a journal 51. Adjacent to the journal there is a tapered portion 52. Next to the tapered portion there is a threaded portion 53 on the mandrel. A collar 54, having internal threads 55, screws over the threaded portion for rigidly positioning the collar longitudinally with relation to the mandrel. The hub 56 of the band-saw wheel is provided with an internally-tapered bore 57, corresponding with the tapered portion 52. Bolts 58 take through apertures 59 in the collar and into internally-threaded holes 60 in the rear of the hub 56 of the band-saw wheel. By drawing up on the bolts the band-saw wheel is forced upon its mandrel and a close locking fit insured between the tapered portions of the mandrel and wheel for compelling the mandrel and wheel to turn together. The threads of the threaded portion 53 and the internal threads 55 of the collar 54 for the lower band-saw wheel and mandrel are left-hand threads, while those for the upper band-saw wheel and mandrel are right-hand threads. In practice the band-saw wheels usually rotate with their upper faces toward the right when facing them from the sawyer's position, and I have indicated them as so rotating in the drawings, as shown by the location of the band-saw guides F F′ in Figs. 1 and 2, and the direction of projection of the teeth of the band-saw blade E in Fig. 2. The pulley K

drives the band-saw wheel, the lower band-saw wheel offering resistance to the drive, and the upper band-saw wheel is rotated by the band-saw blade, the upper mandrel offering resistance to the drive. In other words, the lower band-saw wheel offers resistance to the lower mandrel and the upper band-saw mandrel offers resistance to the upper wheel. The threads between the lower mandrel and collar are left-hand threads, and the threads between the collar and upper mandrel are right-hand threads, as clearly shown in Fig. 2, these threads continuously exerting pull upon the band-saw wheels for drawing them still farther up on the tapers on the mandrel, affording exceptionally secure construction, cheaply made and easily put together. This construction provides secure means for positioning the band-saw wheel on its mandrel in such relation to its front journal as to be closely adjacent to its front bearing, thereby permitting the hub of the wheel to hug the front bearing and minimizing the overhang of the front of the frame and permitting the frame to be set farther back upon its foundation, resulting in less vibration and tendency to tip in the frame and in smoothness of operation. Either the lower or both mandrels may be provided with my improved means for securing the wheel thereon.

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

1. In a band-saw mill, the combination of two uprights for supporting upper wheel, and means employing a clutch and having a common operating-handle for manually operating said clutch and for adjusting one of the uprights or both uprights together.

2. In a band-saw mill, the combination of a pair of columns, a pair of uprights for supporting upper wheel sliding on the columns, a pair of screw-rods for adjusting said uprights, a worm-wheel splined to each screw-rod, a cross-shaft, a sleeve in which said cross-shaft is journaled at one end, a bearing in one of said columns in which said cross-shaft is journaled at its other end, a bearing in the other of said columns for said sleeve, said sleeve having a worm thereon continuously in mesh with one of said worm-wheels, said cross-shaft having a worm thereon continuously in mesh with the other of said worm-wheels, a hand-wheel splined to the end of said shaft at the sawyer's position, said hand-wheel and sleeve having opposing teeth of a tooth-clutch thereon, said hand-wheel forming the sole shifting means for engaging and disengaging said opposing teeth of said tooth-clutch as well as the common operating device for adjusting one of said uprights or both of said uprights together, substantially as described.

3. In a band-saw mill, the combination with the upper saw-wheel mandrel, bearings, slides and screw-rods, of a worm-wheel for each screw-rod, a cross-shaft, a worm secured thereto meshing with one of said worm-wheels, a sleeve in which said cross-shaft turns, said sleeve having a worm thereon meshing with the other of said worm-wheels, a hub having spline connection with said cross-shaft, a clutch between said hub and sleeve, and a single handle manually movable longitudinally of said shaft for operating said clutch and manually rotatable for adjusting one of said screw-rods or both of said screw-rods together, substantially as described.

4. In a band-saw mill, the combination of the upper saw-wheel mandrel, a pair of bearings therefor, a slide connecting with each of said bearings, a threaded rod connecting with each of said slides, tension mechanism on which said threaded rods rest, a worm-wheel splined to each of said threaded rods, a cross-shaft secured against endwise movement, a worm secured to said cross-shaft and meshing with one of said worm-wheels, a sleeve in which said cross-shaft turns, said sleeve having a worm thereon, a handle located at the sawyer's position on said mill and longitudinally slidable and rotatively secured on said shaft, said handle and sleeve having mating tooth clutch-faces, said handle forming a single operating device for manually operating said clutch and for causing selective rotation either of the shaft or shaft and sleeve, substantially as described.

5. In a lower band-saw, the combination of a band-saw wheel having a hub with an internally-tapered bore, a lower band-saw-wheel mandrel having a journal as well as a tapered portion whose largest diameter is farthest removed from said journal, and a left-hand threaded part adjacent said largest diameter, a collar having a left-hand threaded bore taking over said threaded part, driving mechanism for said lower mandrel, and bolts connecting said collar with said hub and acting to draw the internally-tapered bore of said hub upon the externally-tapered portion of said mandrel, substantially as described.

6. In a band-saw, the combination of a lower band-saw wheel and mandrel therefor, an upper band-saw wheel and mandrel therefor, said wheels and mandrels respectively having mating tapering faces, a collar on each mandrel in rear of the band-saw wheel thereon, said lower collar and mandrel having left-hand thread between them and said upper collar and mandrel having right-hand thread between them and drawing means connecting said collars with their respective band-saw wheels, substantially as described.

7. In a band-saw, the combination of a lower band-saw wheel and mandrel therefor, driving means for said mandrel, an upper band-saw wheel and mandrel therefor, said upper band-saw wheel driven by the band-saw blade

passing thereover, said wheels and mandrels respectively having mating tapering faces, said mandrels each having a journal at the smaller end of the tapering face thereon, a collar on each mandrel adjacent the larger end of the tapering face thereon, said respective mandrels and the collars on same having oppositely-inclined threads between them, and drawing means connecting said collars with their respective band-saw wheels, substantially as described.

In testimony whereof I have signed my name hereto in the presence of two subscribing witnesses.

LOUIS J. HANHART.

Witnesses:
ROY STEVENS,
JOHN F. KRENKEL.