

(No Model.)

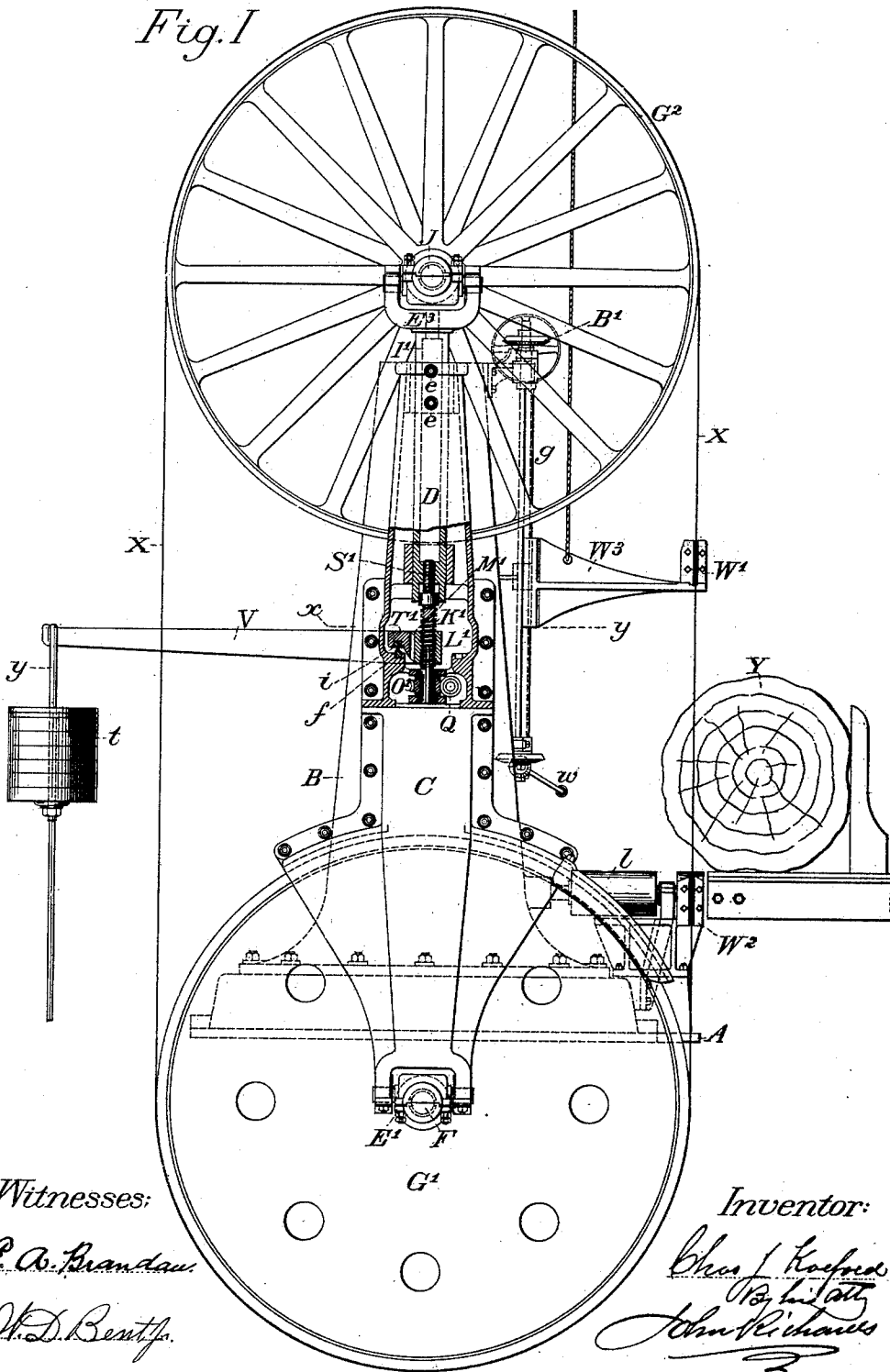
3 Sheets—Sheet 1.

C. J. KOEFOED.
BAND SAW MILL.

No. 468,303.

Patented Feb. 2, 1892.

Fig. 1



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Chas. D. Bentz.

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By his atty
John Richards

(No Model.)

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BAND SAW MILL.

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No. 468,303.

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Fig. II.

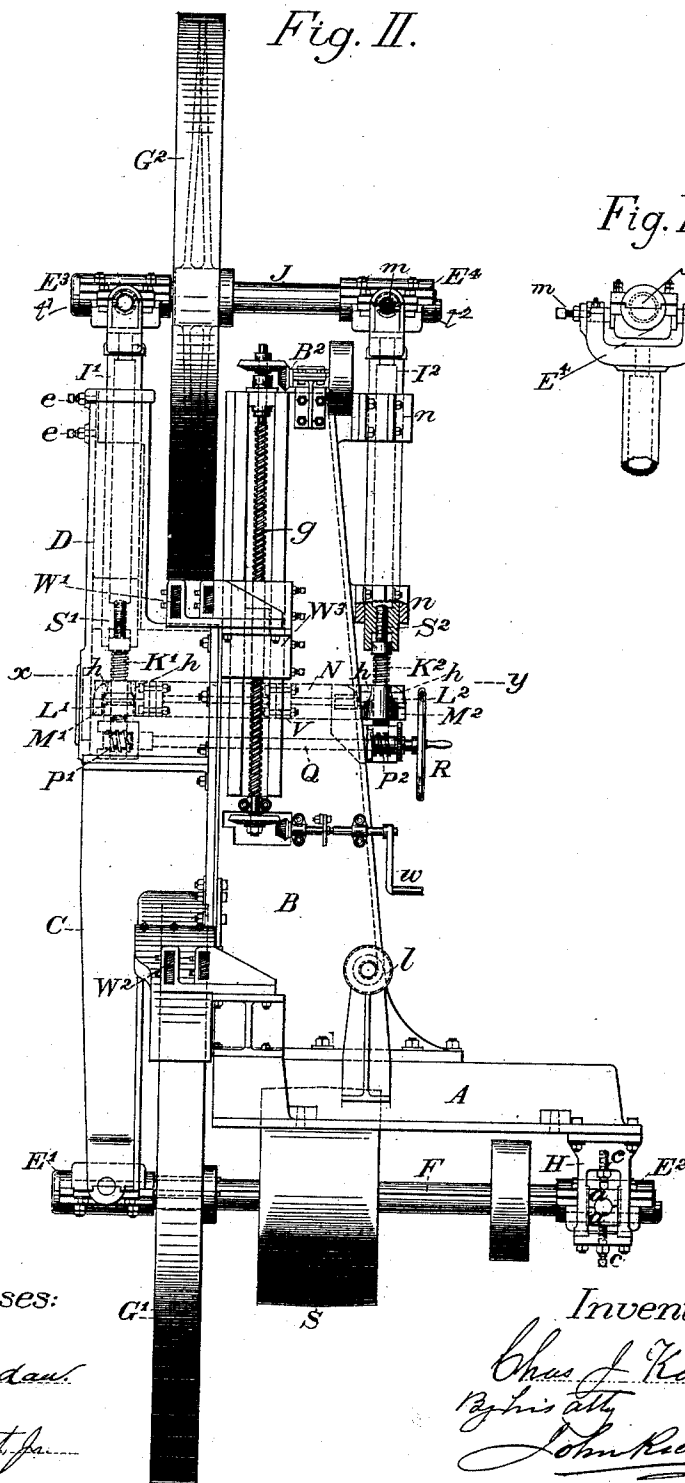
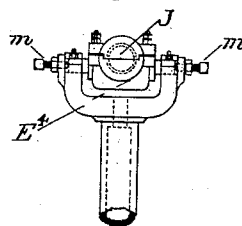


Fig. X



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Fig. III.

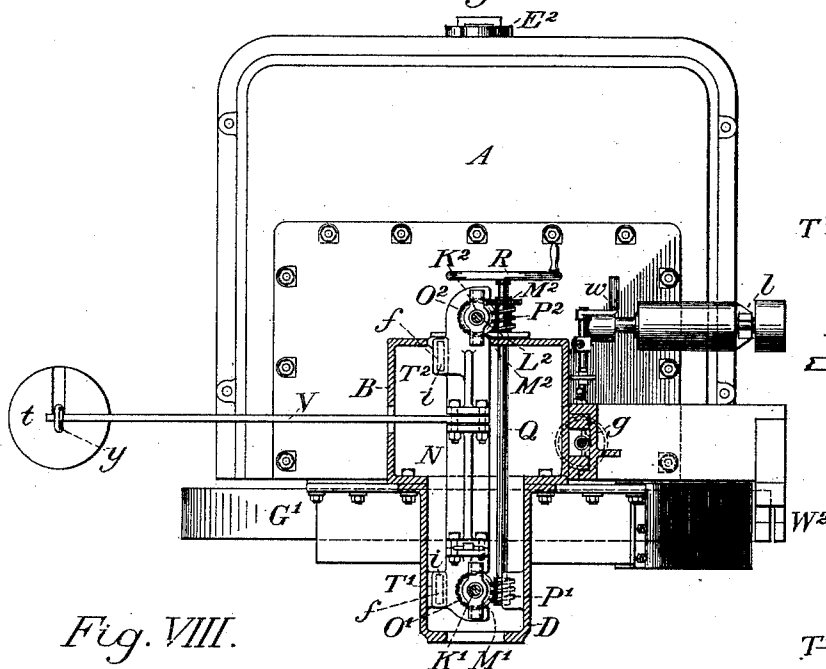


Fig. IX.

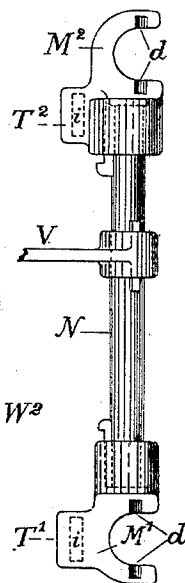


Fig. VIII.

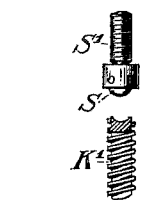


Fig. IV. Fig. V.

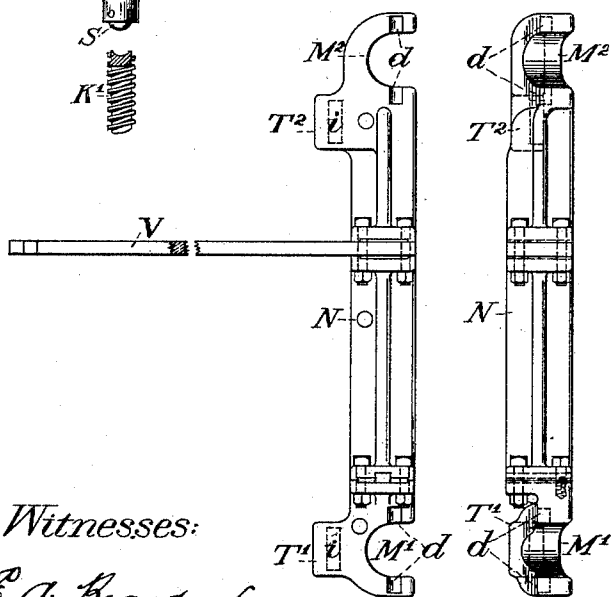
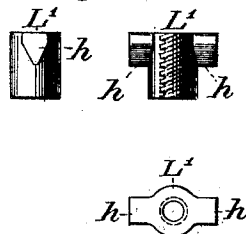


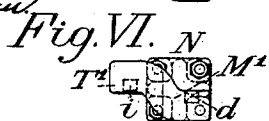
Fig. VII.



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UNITED STATES PATENT OFFICE.

CHARLES J. KOEFOED, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR TO THE
VULCAN IRON WORKS, OF SAME PLACE.

BAND-SAW MILL.

SPECIFICATION forming part of Letters Patent No. 468,303, dated February 2, 1892.

Application filed May 29, 1891. Serial No. 394,561. (No model.)

To all whom it may concern:

Be it known that I, CHARLES J. KOEFOED, a citizen of the United States, residing in the city and county of San Francisco, State of California, have invented certain new and useful Improvements in Band-Saw Mills; and I hereby declare the following description and accompanying drawings to be a full and exact specification of my improvements.

My invention relates to band-saw mills such as are employed for sawing large timber, and especially to the method of mounting, supporting, and adjusting the wheels of such machines and to equalizing the tension on the saw-blades when in use.

My invention consists, essentially, in the construction, arrangement, and combination of the several parts for the purpose of equalizing and rendering uniform the tension of saw-blades and for other purposes, substantially as will be hereinafter described and claimed.

Referring to the drawings, Figure I is a front elevation of a band-saw mill, partially in section, constructed with my improvements. Fig. II is a side view of the same machine, showing the various parts connected and in position. Fig. III is a partial plan view of the mechanism shown in Figs. I and II, taken on line *x y*. Figs. IV and V are enlarged views of the straining-lever for sustaining the top wheel of the machine. Fig. VI is an end view of the mechanism shown in Fig. IV. Fig. VII shows different views of the nut of the sustaining and adjusting screws for the top wheel. Fig. VIII is a detail showing the top bearing or pivot of the adjusting-screws for the top shaft. Fig. IX shows a modification of the straining-lever illustrated in Figs. IV and V. Fig. X is a detail showing the means for mounting the rear bearing of the top wheel-shaft.

Similar letters of reference on the different figures indicate corresponding parts of the machine.

In constructing machines according to my improvements I employ a strong base-plate A, upon the top of which is securely bolted a hollow main supporting-column B. This column B is made in the form of a nearly square

tapering box enlarged at its base, so as to add to its stability. Bolted to the front of this column are two hollow outer members C and D for sustaining the front bearings of the top and bottom band-wheel shafts. At the lower end of the outer column C is fitted a journal-box E', mounted on trunnions that permit the box to adjust itself in a vertical plane to any position of the lower band-wheel shaft F. Mounted on this shaft is the lower band-wheel G' and the main driving-pulley S. The back end of the lower band-wheel shaft is supported by a journal-box E², that is trunnioned in vertically-sliding boxes *a a* in the bracket H, which is securely bolted to the bottom of the base-plate A. The sliding boxes *a a* are supported vertically by set-screws *c c*, so the back end of the shaft F can be raised or lowered to any desired position, and the set-screws then fastened by means of lock-nuts, as shown.

The front member D of the framing is fitted with guides for the cylindrical supporting-stem I', which is telescoped within, as shown by dotted lines in Fig. II. The upper bearing of the member D is fitted with a half-box to clamp the stem I', that can be regulated to take up play or wear by means of two set-screws *e e*, fitted with lock-nuts, as shown in Fig. II. Fitted to the top of the stem I' is a trunnion-box E³ for supporting the front end of the upper band-wheel shaft J, on which is mounted the upper saw-wheel G². The back end of the upper band-wheel shaft J is supported by another trunnion-box E⁴, fitted to the top of the cylindrical stem I². At the top of the stem I² are set-screws *m*, fitted with lock-nuts, as shown in Fig. X. The ends of these set-screws bear against the ends of the trunnions of the bearing E⁴, so that by slackening one screw and setting up the other the bearing E⁴ will be moved in a horizontal plane, thereby giving the shaft what is termed "cross line," and thus secure a proper adjustment in that plane of the wheel G². The stems I' and I² being free to turn in their bearings, the trunnion-bearings E³ and E⁴ are consequently free to adjust themselves in any plane. The outer end of the bearing E³ is closed, as shown at J', Fig. II, to exclude dirt and grit. The other end of the rear upper

bearing E^4 has also a cup or inclosed extension I^2 to retain the oil. The back supporting-stem I^2 is guided by means of bearings n , bolted to the back of the main supporting-column B. The two supporting-stems I' and I^2 are held in position vertically by the supporting-screws K' and K^2 , resting in nuts L' and L^2 , that are pivoted on knife-edge bearings in the yokes M' and M^2 at each end of the combination straining-lever N. (Shown enlarged in the detail drawings, Figs. IV and V.)

The lower end of the supporting-screws K' and K^2 pass down through the nuts L' and L^2 and are secured by feathers to the worm-wheels O' and O^2 . These worm-wheels engage with worms P' and P^2 on the shaft Q, which is operated from the back by the hand-wheel R. It can be readily seen that by revolving the worm-shaft Q both worm-wheels move simultaneously, turning the screws K' and K^2 , so that both the front and back bearings E^3 and E^4 of the upper band-wheel shaft J are raised or lowered at the same time and to the same extent.

The upper end of the supporting-screws K' and K^2 are hardened and made concave and rest against a hardened steel button S, inserted in the lower end of the stems S' and S^2 . These stems are made with a threaded screw, and holes are drilled in their sides, as shown in Figs. VIII, for inserting a pin-lever or other similar instrument for revolving them, thereby raising or lowering the bearings E^3 and E^4 of the upper-wheel shaft independent of the screws K' and K^2 and "tipping" the upper band-wheel. When properly adjusted, the stems S' and S^2 are secured by set-screws.

The supporting and straining lever N, when of cast-iron, is made as shown in Figs. IV and V, having yokes M' and M^2 at each end, in the arms of which are inserted steel gibs d d , on which the knife-edge bearings h h of the nuts L rest. Projecting backward on this lever are two arms T' and T^2 , on the lower side of which are fitted steel gibs i i . These gibs rest upon knife-edge bearings f , fastened in brackets that project one from the inner side of the main column B and the other from the inner side of the member D, as shown in Figs. I and III. Fastened near the center is the long arm V of this straining-lever N, which projects through an opening in the side of the column B, and on this lever are hung the balance-weights t by means of the rod y . This straining-lever (illustrated in Figs. IV and V) may also be constructed as shown in Fig. IX, the central member N^2 being of wrought-iron and cylindrical, as shown. In this manner the frictional resistance to movement of the top wheel G^2 and its supports is nearly eliminated and the saws protected from strains other than are due to their intended work.

W' and W^2 are the saw-guides, and Y a log being sawed. The upper saw-guide W' is supported on a bracket W^3 , which is adjusted

up or down on the main column B by means of the screw g , operated by a crank w and wheel-gearing below or by means of a belt and bevel-gearing, (shown at B^2 , Figs. I and II.)

The two front members C and D of the main frame are made separately and are bolted to the front of the main column B, as shown in Figs. I and II. These members may abut one upon the other or be bolted together, if required, flanges being provided for that purpose.

The roller l is to catch and sustain slabs or pieces sawed from the front of the log Y and prevent their contact with the machinery.

Having thus explained the nature and objects of my invention and the method of applying and constructing the same, what I claim as new, and desire to secure by Letters Patent, is—

1. In a band-saw mill, the combination of the wheels and their shafts, pivoted bearings for the ends of said shafts, which bearings are mounted on trunnions, the bearings for the upper-wheel shaft being free to adjust themselves both vertically and horizontally and those for the lower-wheel shaft being free to adjust themselves in a vertical plane, and straining mechanism for the saw.

2. In a band-saw mill, the combination of the adjusting-screws formed with spherical pivotal bearings, the tangent screws therefor, worm-wheels engaged by said tangent screws, and the independent adjusting-stems, all arranged so that the upper-wheel shaft can be raised or lowered at each end or at either end independently to permit the adjustment of the upper wheel in a vertical plane, substantially as described.

3. In a band-saw mill, the forked or double straining-lever having an operating-arm, knife-edge bearings, and crotches at each end, in combination with the nuts received into said crotches, substantially in the manner and for the purpose set forth.

4. In a band-saw mill, the combination of the upper-wheel shaft, its trunnion-provided bearings, the vertical supporting-stems suitably constructed to receive and support the trunnions on the said bearings, said stems being screw-threaded at their lower ends, the independent adjusting-stems engaging said screw-threaded lower ends, the main adjusting-screws formed with spherical pivotal bearings, and the forked straining-lever, substantially as described.

5. In a band-saw mill, the combination of the upper-wheel shaft, its trunnion-provided bearings, the vertical supporting-stems wherein the said trunnions are mounted, the lower ends of said stems being screw-threaded, independent adjusting-screws engaging said lower screw-threaded ends, the main adjusting-screws having spherical pivotal bearings and provided with worm-wheels engaging tangent screws, together with the nuts on the said main adjusting-screws, which nuts are

supported in crotches of a straining-lever, together with the said straining-lever and its operating-arm, substantially as described.

6. In a band-saw mill, a fulcrum-shaft having a central member N^2 , detachable crotches M' and M^2 , with fulera i , set to one side of the axis, an arm V , and knife-edge seats d , substantially as described.

7. In a band-saw mill, the combination of the straining-lever N , having yokes M' and M^2 at each end, in the arms of which are inserted steel gibs d , said lever N having also rearwardly-projecting arms T' T^2 , fitted with steel gibs i , the nuts L' and L^2 , having knife-edge bearings h , which rest on the gibs d , the knife-edge bearings f , supporting the gibs i , the handle B , and the upper shaft and its connections, substantially as described.

8. In a band-saw mill, the combination of the straining-lever N , having yokes M' and M^2 at each end, in the arms of which are the gibs d , said lever being also provided with gibs i , the knife-edge bearings f , on which the gibs i rest, the nuts L' and L^2 , located within the yokes and having knife-edge bearings h , resting on the gibs d , the main adjusting-screws k' and k^2 , on which the nuts L' and L^2 are lo-

cated, the worm-wheels O' and O^2 , secured on the set-screws K' and K^2 , the worm-shaft having worms P' and P^2 , that engage the worm-wheels, the vertical supporting-stems, and the upper-wheel shaft and its bearings, substantially as described.

9. In a band-saw mill, the combination of the upper-wheel shaft and its bearings, the vertical supporting-stems I' and I^2 , in which said bearings are trunnioned, the stems S' and S^2 , engaging the lower screw-threaded sockets I' and I^2 , the adjusting-screws K' and K^2 , carrying worm-wheels O' and O^2 , engaging worms P' and P^2 , the shaft Q , the nuts L' and L^2 on the screws K' K^2 , said nuts having knife-edge bearings h , and the straining-lever N , having yokes M' and M^2 , receiving the nuts L' and L^2 and having also gibs d , on which the knife-edge bearings h rest, substantially as described.

In testimony whereof I have hereunto affixed my signature in the presence of two witnesses.

CHARLES J. KOEFOED.

Witnesses:

ALFRED A. ENQUIST,
W. D. BENT, Jr.