No. 616,219. Patented Dec. 20, 1898.

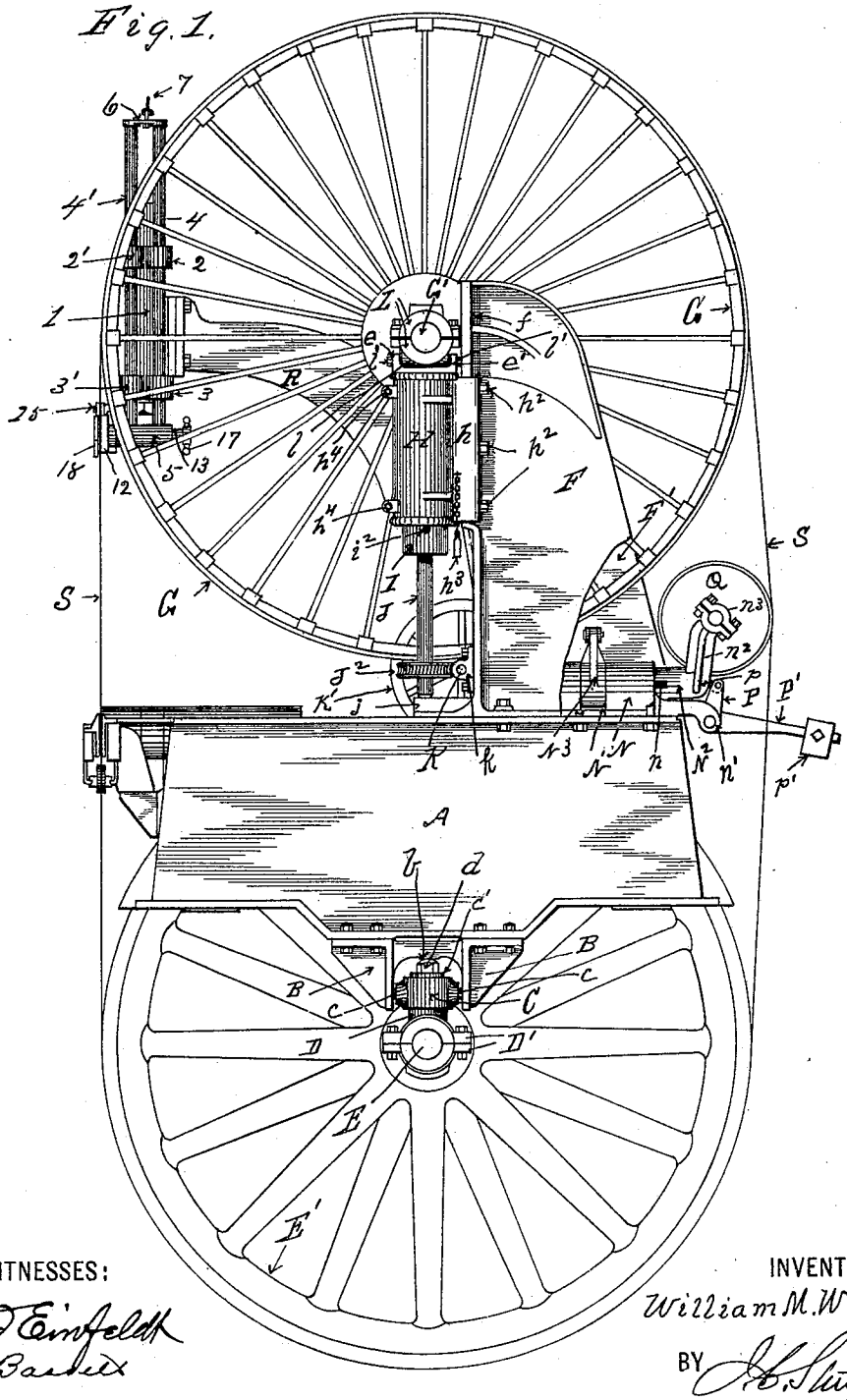
W. M. WILKIN.

BAND SAW MILL.

(Application filed Nov. 9, 1897.)

(No Model.) 3 Sheets—Sheet 1.

Fig. 1.



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Fig. 3.

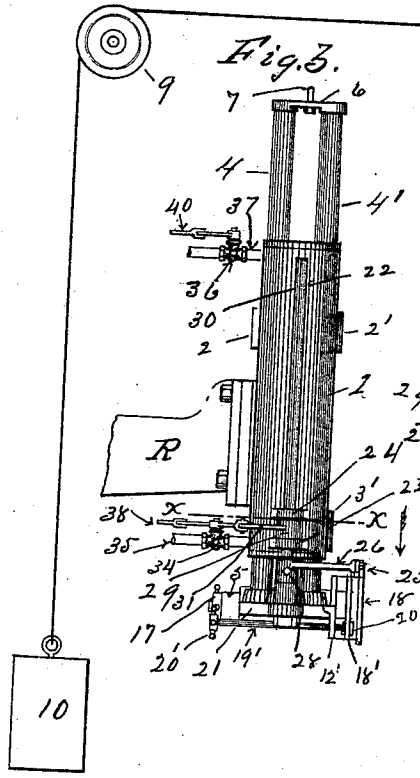
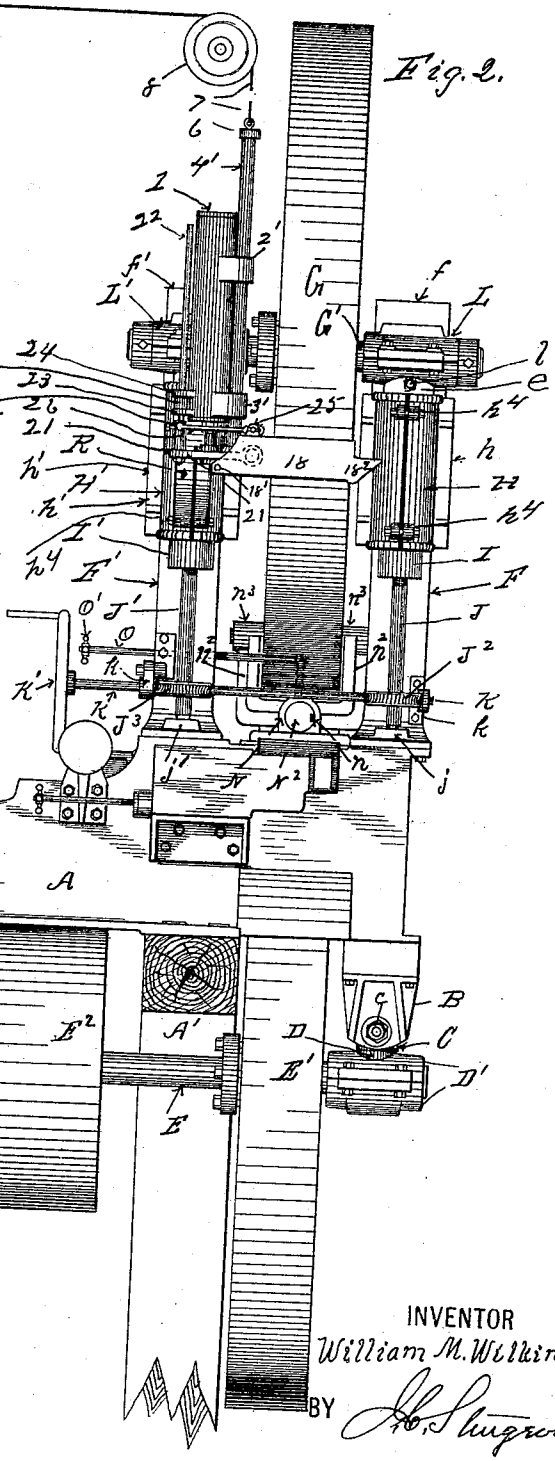


Fig. 2.



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Fig. 4.

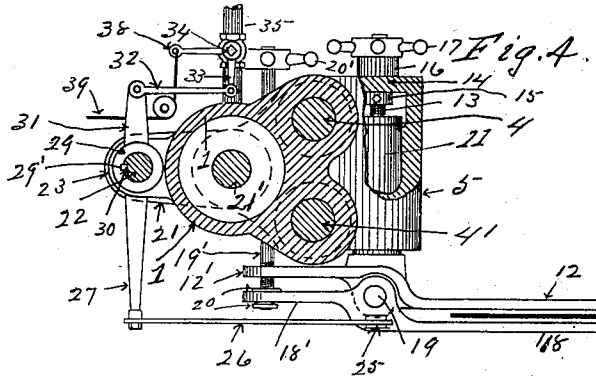


Fig. 7.

Fig. 5.

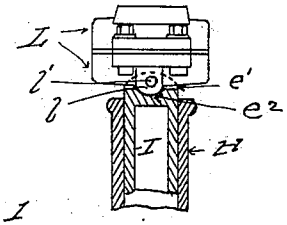
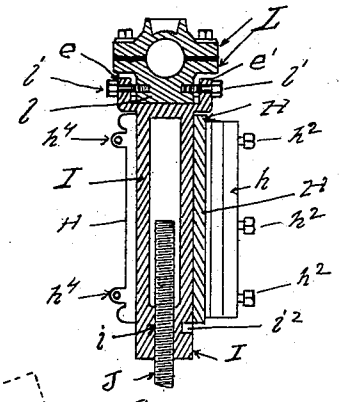
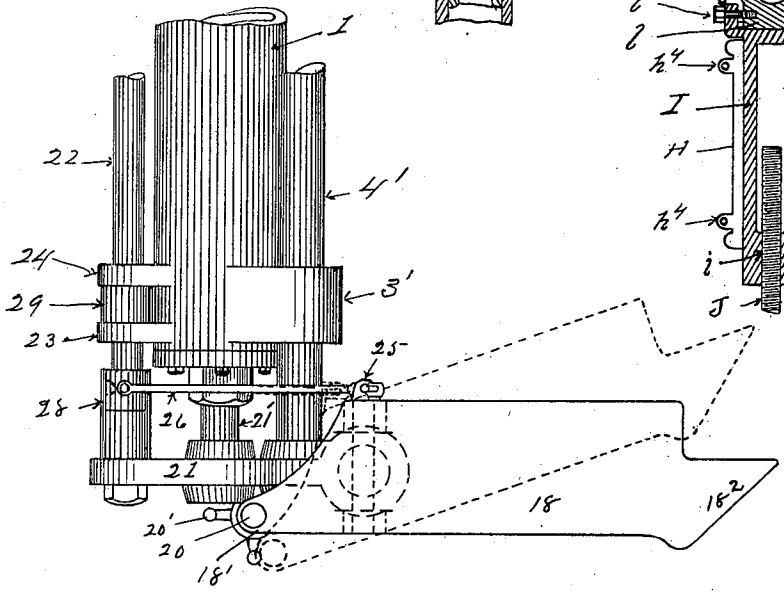
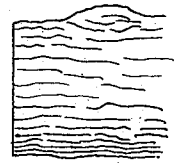


Fig. 6.







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UNITED STATES PATENT OFFICE.

WILLIAM M. WILKIN, OF ERIE, PENNSYLVANIA.

BAND-SAW MILL.

SPECIFICATION forming part of Letters Patent No. 616,219, dated December 20, 1898.

Application filed November 9, 1897. Serial No. 657,924. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM M. WILKIN, a citizen of the United States, residing at the city of Erie, in the county of Erie and State of Pennsylvania, have invented certain new and useful Improvements in Band-Saw Mills; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, forming part of this specification.

My invention relates to improvements in band-saw mills, the leading features of which relate to adjustable mechanism for supporting the bearings of the upper saw-wheel and to mechanism for automatically adjusting the saw-guide, the construction and operation of which, together with other features of the invention, are hereinafter set forth and described, and illustrated in the accompanying drawings, in which—

Figure 1 is a side view in elevation of my improved band-saw mill. Fig. 2 is a front view in elevation of the same without the saw. Fig. 3 is a side view in elevation of the saw-guide mechanism. Fig. 4 is an enlarged transverse section of the same on the line $x\,x$ in Fig. 3, looking in the direction of the arrow. Fig. 5 is an enlarged front view of the lower portion of the saw-guide mechanism. Fig. 6 is an enlarged vertical section of one of the adjustable cylinders and plungers with the shaft-bearing. Fig. 7 is a section of the same at right angles to the section shown in Fig. 6.

In the construction of my invention illustrated in these drawings, A is the base of the frame of the mill, secured to suitable framework A'. To the under surface of the base A are secured hangers B B', in which are mounted vertical sleeves C C upon trunnions $c\,c$, secured in the hangers B B' so as to be laterally adjustable therein. In these sleeves there are pistons D, made integral with the upper halves of the boxes D'. The upper ends of the sleeves C C are provided with circular collars or plates c', which rest upon the upper ends of the sleeves and through the centers of which screws d pass down into the upper ends of the pistons D, so that the pistons D can be adjusted up and down in the sleeves C, the heads of the screws d abutting against the under surfaces b of the upper portions of the hangers B, so as to resist the upward strain upon the boxes D'. The lower halves of these boxes are of ordinary construction and are secured to the upper halves thereof in the usual manner. In these boxes D' D', I mount the shaft E, supporting the lower saw-wheel E' and the driving-pulley E^2. Secured to the top of the base A of the frame are two uprights F and F', between which the upper saw-wheel G operates. On the upper parts of these uprights are vertical guides f and f'. Upon these guides f and f' the slides $h\,h'$ of independent vertical cylinders H and H' are mounted and are adapted to be moved up and down thereon, as hereinafter set forth, and be secured at any desired point or points on said guides f and f' by means of set-screws h^2, passing through the slides h and h'. In these cylinders H and H' are vertically-moving pistons I and I', adapted to be moved up and down in said cylinders by means of vertical screws J and J', which extend up into screw-threaded openings $i\,i$ in the centers of said pistons, as illustrated in Figs. 6 and 7, the lower ends of these screws J and J' resting on bearings $j\,j'$. Above these bearings are worm-wheels J^2 and J^3 on the screws J and J', which intermesh with worms (not shown) on a transverse shaft K, mounted in bearings k on the uprights F and F', upon one end of which shaft there is a hand-wheel K', whereby the screws J and J' can be simultaneously operated to raise or lower the pistons I and I', or the pistons I and I' and the cylinders H and H' can both be simultaneously raised or lowered by placing pins h^3 in the holes i^2 in the pistons I and I', as illustrated in Fig. 1, and then releasing the set-screws h^2 in the slides h and h'.

To prevent lost motion between the cylinders H and H' and the pistons I and I' operating therein, the cylinders are preferably split vertically on one side from end to end and provided with ears h^4 on each side of said slits through which bolts pass, whereby the cylinders can be tightened upon the pistons as desired, this feature being clearly shown in Figs. 1, 2, and 6. These cylinders may,

however, be made without the slits, if desired. Upon the upper ends of the pistons I and I' are ears *e e'*, and between these ears there is a semicircular recess e^2 in the upper ends of the pistons I and I', as shown in Fig. 7, and on the lower sides of the lower halves of the shaft-bearings L and L' there are corresponding semicircular projections *l*, adapted to fit into the recesses e^2 in the upper ends of the pistons, between the ears *e* and *e'* thereon. These semicircular projections *l* are somewhat shorter than the distance between the ears *e* and *e'*, so as to admit of their being moved endwise in the semicircular recesses in the upper ends of the pistons in which they rest. This is accomplished by means of screws *l'*, passing through the ears *e* and *e'* and the semicircular projections *l* in the axes of the semicircles formed thereby, as illustrated in Figs. 6 and 7. The upper halves of the shaft-bearings L and L' are of usual and ordinary construction and are bolted to the lower halves of the shaft-bearings in the usual manner, and in these shaft-bearings the shaft G' of the upper saw-wheel G is mounted. By means of the adjustment of the cylinders H and H' up and down on the guides *f* and *f'* on the uprights F and F' of the frame I am enabled to adjust the shaft-bearings of the upper wheel so as to use saws of very considerable difference in length, and by means of the adjustment of the pistons I and I' within the cylinders I provide for smaller variations in the lengths of the saws used, and by means of the ears *e e'* on the upper ends of the cylinders and the transversely-adjustable semicircular bearings between them I provide for the adjustment of the shaft-bearings so as to bring the upper saw-wheel G into line with the lower saw-wheel E'.

On the top of the base A of the frame, at the rear end thereof, I secure a horizontal sleeve N with a transverse slot N' through the upper central portion thereof, and in this sleeve I place a rotative cylinder N^2, provided with a longitudinal groove *n* therein, and in the slot N' there is an arm N^3, the lower end of which fits around the cylinder N^2 and is provided with a spline (not shown) which fits into the groove *n* in the cylinder, and to the upper end of the arm N^3 there is connected the end of a rod O, which is screw-threaded where it passes through upright F', and there is a hand-wheel O' on the end of the rod O, whereby it can be rotated and through the arm N^3 operate to rotate the cylinder N^2 in the sleeve N, as and for the purpose hereinafter described. On the outer end of the sleeve N there are arms *n'*, which project rearwardly and downwardly from the end of the sleeve and have journaled therein a bell-crank lever P P', the upward arm P of which is coupled to the outer end of the cylinder N^2 by a link *p*, (shown in dotted lines in Fig. 1,) and the horizontal arm thereof, extending out rearwardly at one side of the saw, is provided with an adjustable weight *p'*. On the upper side of the rear end of the cylinder N^2 are two upright arms n^2, having bearings n^3 on their upper ends in which an idler-pulley Q is mounted, adapted to bear against the saw S and keep it tight upon the saw-wheels G and E'.

In operation the cylinder N^2 can be rotated to adjust the pulley Q to the saw by means of the screw-rod O and the arm N^3, and the weight *p'* on the arm P' of the bell-crank lever P P', operating, through the link connection *p*, with the cylinder N^2, moves the cylinder longitudinally, so as to force the idler-pulley Q against the saw and to produce such tension thereon as the adjustment of the weight *p'* on the arm P' of the bell-crank lever may indicate. In operation this idler-pulley Q can be adjusted by means of the rotation of the cylinder N^2, upon which it is mounted, as hereinbefore described, so as to bring the idler-pulley Q to bear upon the saw S in such a manner as to keep the saw in its proper position on the saw-wheels G and E'.

On the front side of the cylinder H', I secure a forwardly-projecting arm R, to the front end of which is bolted an upright steam-cylinder 1. (See Figs. 1, 2, and 3.) On the side of this cylinder next the saw-wheel G there are guides 2 2' and 3 3'. In these guides two vertically-moving rods 4 4', joined to a cylindrical sleeve 5 at the lower ends and having a cross-piece 6 on the upper ends thereof, operate. From this cross-piece 6 a rope 7 passes over pulleys 8 and 9 to a counterbalance-weight 10, as illustrated in Fig. 2. Within the sleeve 5 there is mounted a cylinder 11, on one end of which is secured the inner portion 12 of the saw-guide, and in the other end there is an adjusting-screw 13, which passes through the end 14 of the sleeve 5, where it is provided with collars 15 and 16 to prevent longitudinal movement therein, the end of the screw 13 passing into the end of the cylinder 11, so that the rotating of the screw 13 by means of the hand-wheel 17 thereon moves the cylinder 11 longitudinally in the sleeve 5. The outer portion 18 of the saw-guide is pivoted on a vertical pintle 19 on the end of the cylinder 11, outside of the junction of the inner portion 12 of the saw-guide therewith, and between the rearwardly-projecting ends 12' and 18' of the saw-guide there is a rod 19', screw-threaded in the part 12' and secured in the part 18' by collars 20 and provided with a hand-wheel 20', whereby the parts 12 and 18 of the saw-guide can be moved toward or from each other.

The projection 21 on the side of the sleeve 5, by means of which the rods 4 and 4' connect with said sleeve, extends through under the lower end of the steam-cylinder 1, where it connects with the piston-rod 21' thereof, and out beyond the opposite side thereof, as shown in Fig. 5, where it has an upright rod 22 journaled therein. This rod passes up through ears 23 and 24 on the cylinder and slides freely up and down therein. On the

upper edge of the section 18 of the saw-guide there is an ear 25, on which is pivoted a rod 26, which extends longitudinally to and connects to another rod 27, extending rearwardly at right angles to the rod 26 to a collar 28, surrounding and secured to the lower part of the vertical rod 22, so that the movement of these rods 26 and 27, actuated by the raising of the outer end of the saw-guide, as illustrated by dotted lines in Fig. 5, will rotate the upright rod 22. Between the ears 23 and 24, on the lower end of the cylinder 1, there is a collar 29, provided with a spline 29′, which engages a longitudinal groove 30 in the vertical rod 22, so that when the rod 22 is rotated the collar 29 rotates in unison with it. From this collar 29 a horizontal arm 31 extends to and connects with a horizontal rod 32 at right angles therewith, which in turn connects with the operating-arm 33 of a three-way valve 34 in a pipe 35, which enters the lower end of the cylinder 1 and supplies steam thereto. This mechanism operating automatically, when the inclined front end 18^2 of the saw-guide 12 18 strikes a log being sawed or an obstruction thereon it raises the front end of the saw-guide, as shown in dotted lines in Fig. 5, and operates the mechanism hereinbefore described to open the valve 34 and admit steam to the cylinder 1, which, acting on the piston in the cylinder, raises it and the whole saw-guide-supporting mechanism connected by the plate 21 with the piston-rod 21′ until the front end 18^2 of the saw-guide 12 18 falls to its normally horizontal position, which operates the valve mechanism to cut off the steam and open the other passage of the three-way valve 34, so as to allow the steam to escape from the cylinder, the counterbalance-weight 10 meanwhile retaining the saw-guide mechanism in the position to which it has been so raised until steam is admitted by the operator by lever mechanism 40 through a three-way valve 36 in the pipe 37, leading into the upper end of the cylinder 1, which moves the saw-guide mechanism downward again to such point as the operator desires. The valve 34 is also provided with a hand-operated lever 38, from which a cord 39 leads to some convenient point for the operator, so that the operator can open the valve 34 by hand, and thereby raise the saw-guide mechanism to any desired point if he desires.

Having thus described a convenient construction of my invention as well as the operation of the several features thereof, so that those skilled in the art to which it appertains can construct and operate the same, I do not confine myself to the exact forms of the construction thereof herein shown and described, as

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a band-saw mill, the combination of uprights on the frame between which the upper saw-wheel is adapted to be mounted, vertical guides on said uprights, independent cylinders mounted and vertically adjustable on said guides, pistons in said cylinders and means for actuating said pistons therein, and shaft-bearings mounted in semicircular recesses in the tops of said pistons, substantially as and for the purpose set forth.

2. In a band-saw mill, the combination of two uprights on the frame, a cylinder mounted and vertically adjustable on each of said uprights and means for securing said cylinders at any point thereon, pistons adapted to move vertically in said cylinders, shaft-bearings mounted in semicircular recesses in the tops of said pistons, vertical screws for actuating said pistons, and adapted also to adjust the cylinders on their supports when desired, and means for actuating said screws, substantially as and for the purpose set forth.

3. The combination in a band-saw mill, of an upper-saw-wheel shaft-bearing and support therefor, comprising substantially a support having a semicircular recess in the top thereof and ears at the ends of said recess, and a semicircular projection on the lower half of the shaft-bearing, transverse to the shaft operating therein, and resting in the semicircular recess in the top of the support, and set-screws passing through the ears at the ends of the recess, and into the axis of the circular projection on the shaft-bearing, whereby the shaft-bearing can be adjusted transversely to the line of the shaft, substantially as set forth.

4. In a band-saw mill, the combination of an upright on the frame, a hollow cylinder, having a saw-guide-supporting arm thereon and mounted and vertically adjustable on said upright, with a piston in said cylinder having a shaft-bearing on the upper end thereof, and means adapted to raise and lower said cylinder and piston in unison, or separately, substantially as and for the purpose set forth.

5. In a band-saw mill, the combination of an upright on the frame, shaft-supporting mechanism vertically adjustable on said frame, a saw-guide-supporting arm secured to said shaft-supporting mechanism so as to be raised and lowered in unison therewith, saw-guide-supporting mechanism mounted and vertically adjustable on said saw-guide-supporting arm, and a saw-guide pivoted to the saw-guide-supporting mechanism, so that the front end thereof will be automatically raised by any obstruction encountered thereby, substantially as set forth.

6. The combination in the saw-guide mechanism of a band-saw mill, of a vertical steam-cylinder mounted on a suitable support, vertically-movable saw-guide-supporting mechanism connected with and adapted to be actuated by a piston in said steam-cylinder, a saw-guide so pivoted to the vertically-movable saw-guide-supporting mechanism that the front end thereof will automatically rise

when an obstruction is encountered thereby, substantially as set forth.

7. The combination in the saw-guide mechanism of a band-saw mill, of a vertical steam-cylinder mounted on a suitable support, vertically-movable saw-guide-supporting mechanism connected with and adapted to be actuated by a piston in said steam-cylinder, a saw-guide pivoted to the vertically-movable saw-guide-supporting mechanism so that the front end thereof will be raised by any obstruction encountered thereby, and mechanism connecting the saw-guide with a valve admitting steam to the lower end of the cylinder whereby the raising of the front end of the saw-guide opens said valve, substantially as set forth.

8. In a band-saw mill, the combination of a saw-guide-supporting arm, a vertical steam-cylinder on said arm, vertically-movable saw-guide-supporting mechanism mounted in guides on said steam-cylinder, and connected with and adapted to be actuated by the piston-rod in said cylinder, a steam-pipe connected with the lower end of said cylinder having a valve therein, a steam-pipe connected with the upper end of said cylinder having a valve therein, a saw-guide so pivoted to the vertically-movable saw-guide-supporting mechanism that the front end thereof will automatically rise when any obstruction is encountered thereby, lever and connecting-rod mechanism so connecting the saw-guide with the valve in the lower steam-pipe entering the steam-cylinder, that raising the front end of the saw-guide will automatically open said valve and admit steam to the lower end of the cylinder and raise the saw-guide-supporting mechanism, substantially as set forth.

9. In a band-saw mill, a lower-saw-wheel shaft-bearing, substantially comprising a forked hanger secured to the under side of the frame, a vertical sleeve suspended on trunnions in said hanger, a piston on the upper half of the shaft-box passing up into said vertical sleeve, a disk on the top of said sleeve and a set-screw, the head of which fills the space vertically between the top of said collar and the bottom of the frame, extending down through a hole in said collar and into the upper end of said piston, whereby said piston can be raised and lowered in said sleeve, substantially as and for the purpose set forth.

10. In a band-saw mill, a saw-tightener pulley mechanism, comprising substantially a sleeve on the rear of the frame, a bell-crank lever pivoted in ears at the end of said sleeve, a cylinder adapted to slide and rotate in said sleeve, lever-and-screw mechanism for rotating said cylinder, and link mechanism connecting said cylinder with one arm of the bell-crank lever pivoted at the end of the sleeve for moving said cylinder longitudinally, and an idler-pulley mounted in arms on said cylinder and adapted to contact with the inside of the saw, substantially as and for the purpose set forth.

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

WILLIAM M. WILKIN.

Witnesses:
H. J. CURTZE,
FRED EINFELDT.