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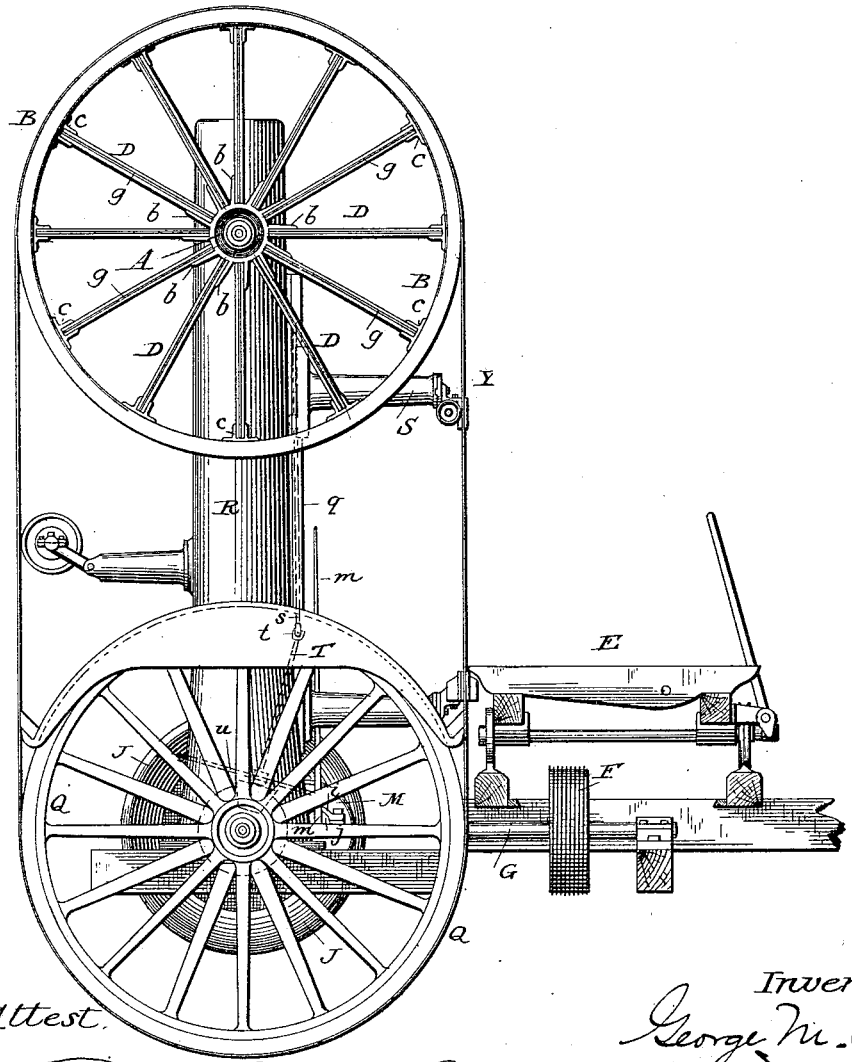
BAND SAW MILL.

No. 348,280. Patented Aug. 31, 1886.

Fig. 1.



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Sidney R. Hollingsworth

Walter S. Dodge.

Inventor:

George M. Hinkley,

by Dodger Son,

his Attys

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Fig. 2.

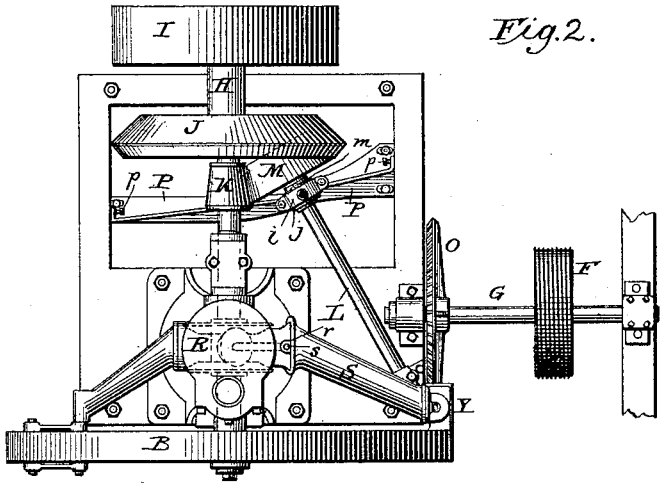
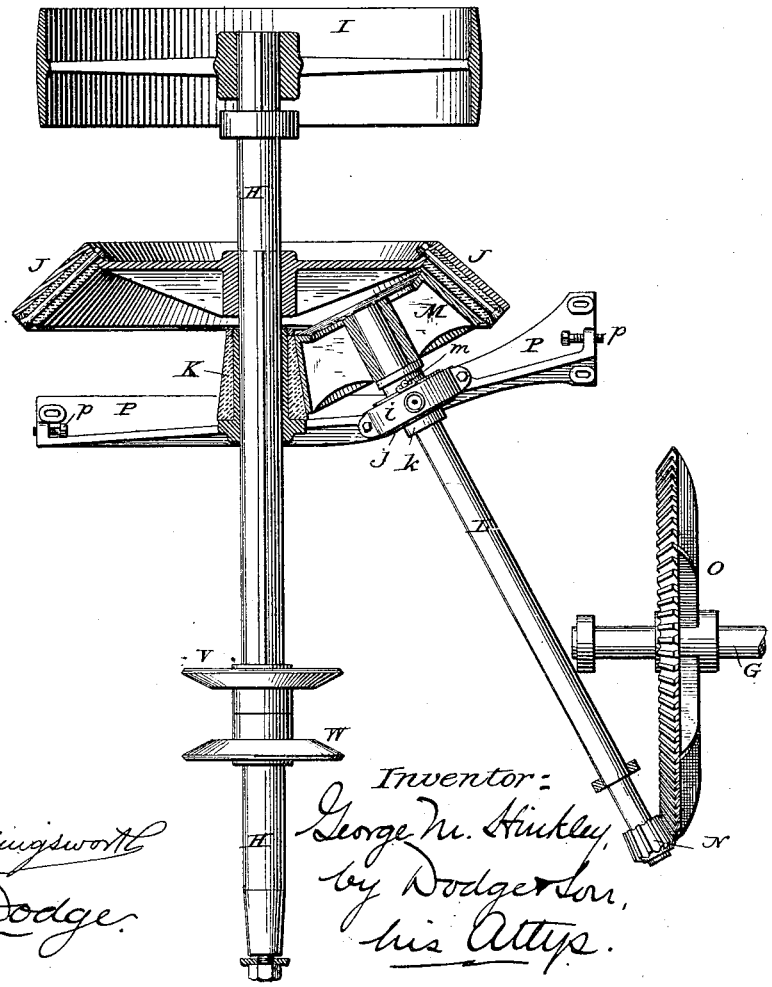


Fig. 3.



Attest.
Sidney P. Hollingsworth
Walter S. Dodge.

Inventor:
George M. Hinkley,
by Dodger Son,
his Attys.

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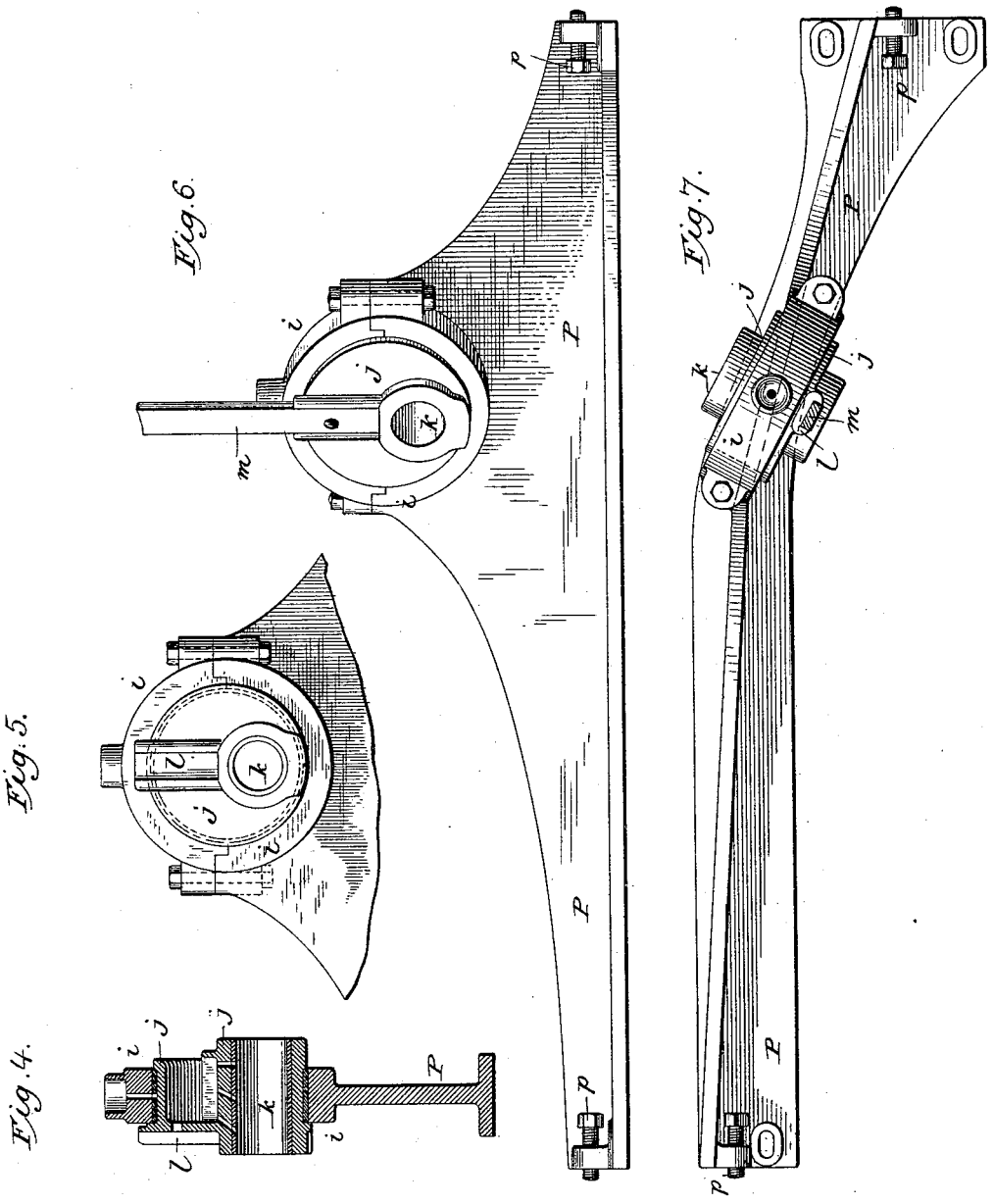

Attest.

Sidney P. Hollingsworth
Walter S. Dodge.

Inventor:
George M. Hinkley,
by Dodger Son,
his Attys.

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G. M. HINKLEY.

BAND SAW MILL.

No. 348,280. Patented Aug. 31, 1886.

Fig. 8.

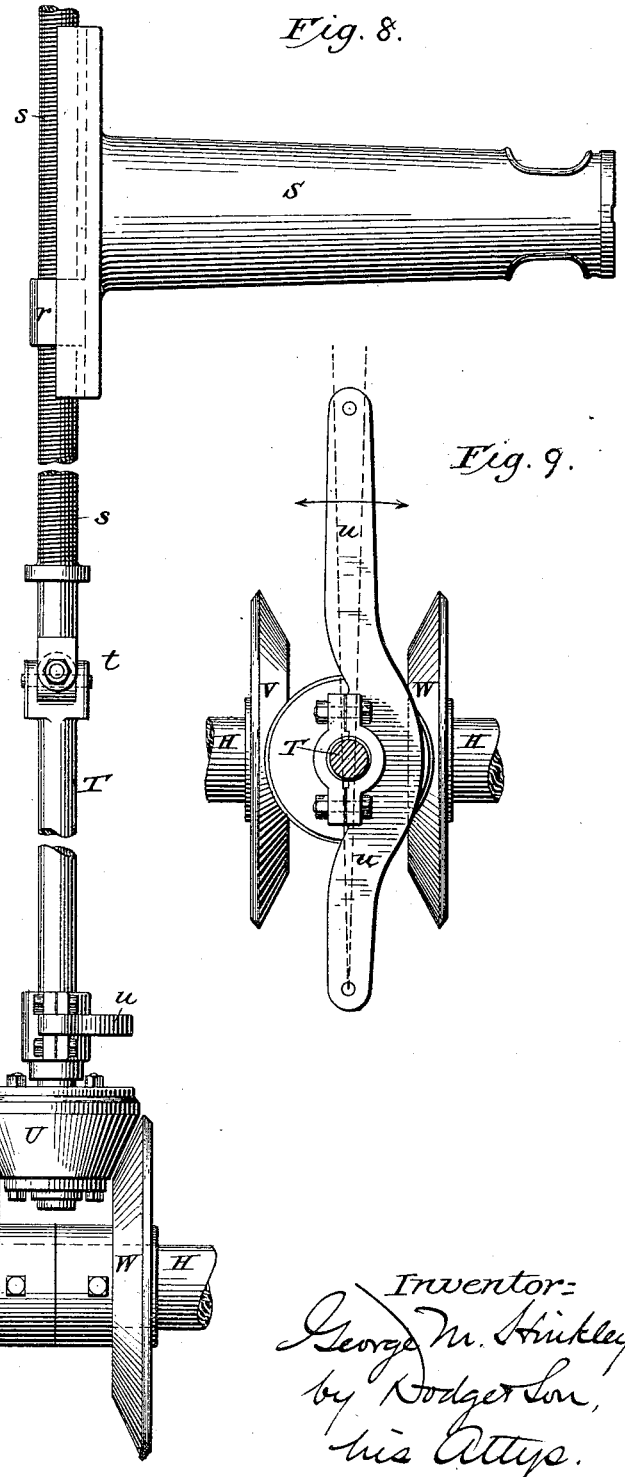

Fig. 10.

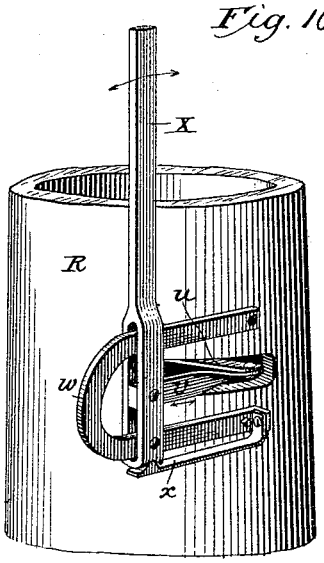

Fig. 9.

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Sidney R. Hollingsworth

Walter S. Dodge.

Inventor:

George M. Hinkley,

by Dodger Son,

his Attys.

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BAND SAW MILL.

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Fig. 12.

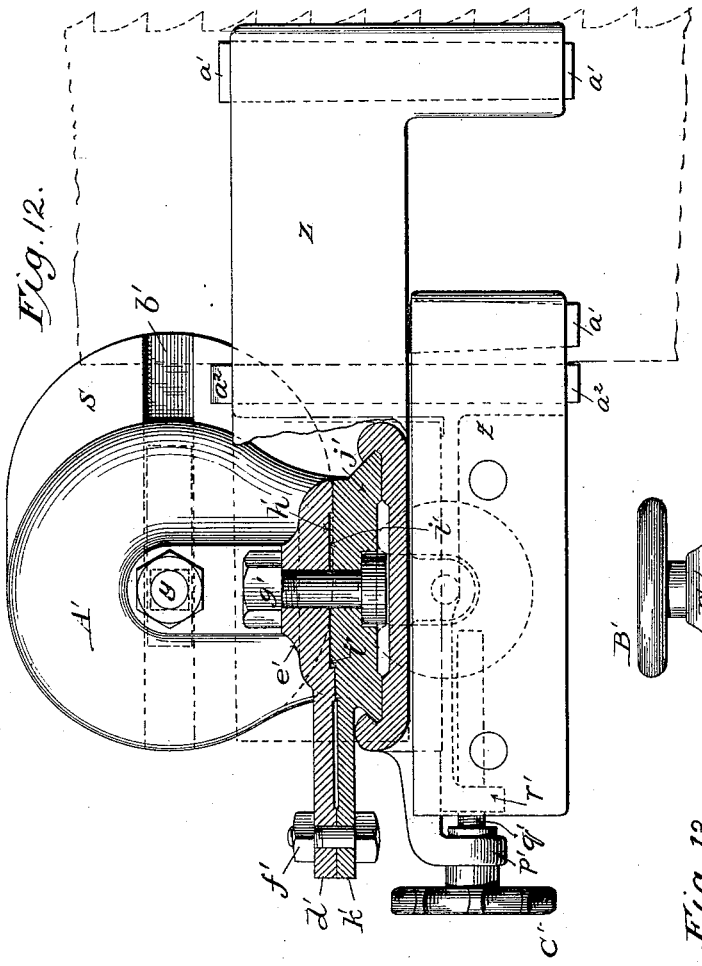


Fig. 13.

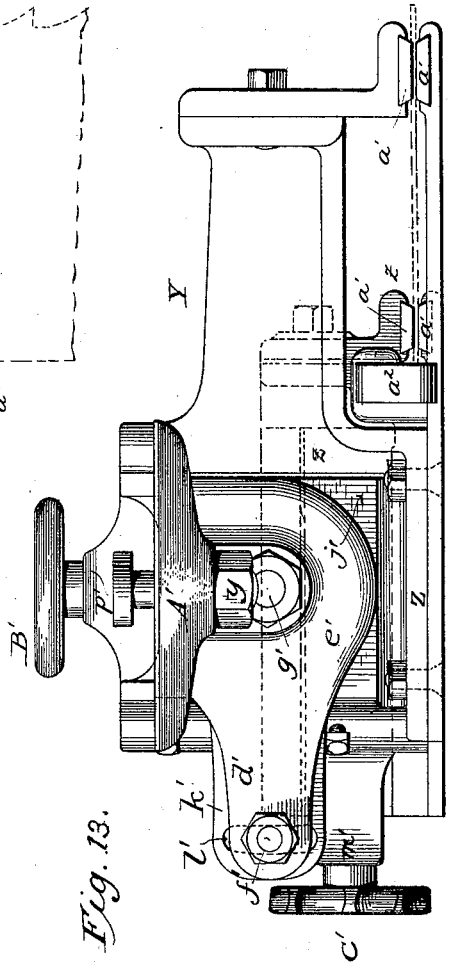
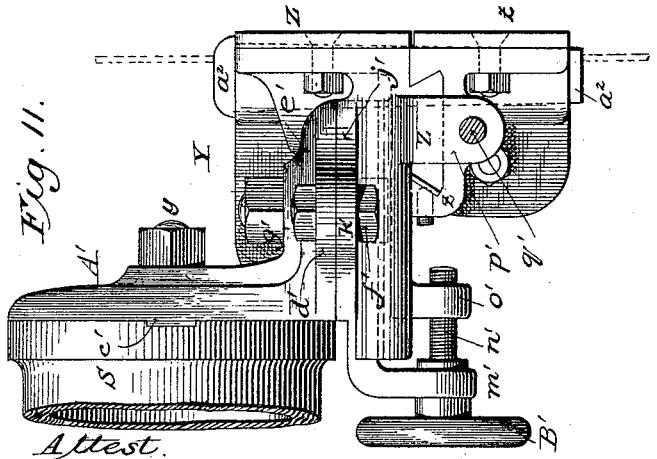


Fig. 11.



Attest.

Sidney P. Hollingsworth

Walter F. Dodger.

Inventor:

George M. Hinkley,

by Dodger Son

his Attys.

UNITED STATES PATENT OFFICE.

GEORGE M. HINKLEY, OF MILWAUKEE, WISCONSIN, ASSIGNOR OF ONE-HALF TO EDWARD P. ALLIS, OF SAME PLACE.

BAND-SAW MILL.

SPECIFICATION forming part of Letters Patent No. 348,280, dated August 31, 1886.

Application filed March 25, 1886. Serial No. 196,450. (No model.)

To all whom it may concern:

Be it known that I, GEORGE M. HINKLEY, of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Band-Saw Mills, of which the following is a specification.

My invention relates to band-saw mills; and it consists, first, in a novel construction of mechanism for imparting motion to the saw and the traveling carriage; second, a novel construction of devices for raising and lowering the upper saw-guide; and, third, in a novel construction of the guide itself.

In the drawings, Figure 1 is a side elevation of a band-saw mill embodying my improvements, the traveling saw-carriage being shown in end elevation; Fig. 2, a top plan view of the machine; Fig. 3, a horizontal section showing the mechanism for driving the saw and the carriage; Figs. 4, 5, 6, and 7, detail views relating to the driving mechanism; Figs. 8, 9, and 10, views illustrating the mechanism by which the upper saw-guide is raised and lowered; Figs. 11, 12, and 13, views illustrating the construction of the upper guide.

Referring now to Figs. 1, 2, and 3, the mechanism by which motion is imparted to the saw and to the traveling carriage will be explained.

In mills of this character the carriage must have reciprocating movement past the saw, and to accomplish this by means of the power applied to drive the saw is one of the objects of the present invention.

E represents the saw-mill carriage, which may be of the usual construction, the said carriage being attached at each end by a band or rope (not shown) to a winding-drum, F, mounted on a shaft, G, journaled in a suitable bearing. As the shaft G is rotated in one direction, the rope or band unwinds and causes the carriage to move in one direction, and when rotated in the reverse direction the rope or band winds upon the drum and causes the carriage to travel in the reverse direction, as usual in this class of mills.

H indicates the main shaft of the machine, provided with a band-wheel, I, through which motion is imparted to the machine; and, further, provided with a large hollow friction-wheel, J, and a smaller bevel friction-wheel, K, as clearly shown in Figs. 2 and 3, all the wheels I J K being rigidly keyed to the shaft.

L indicates a shaft extending at an angle across the front side of the machine, carrying at one end a bevel friction-wheel, M, and at its other end a small bevel gear-wheel, N, which latter is adapted to mesh with a larger bevel-gear, O, on the shaft G, as shown in Figs. 2 and 3. The friction-wheel M of shaft L extends in between the friction-wheels J K, so as to run in contact with one or the other, as may be desired, and to permit such contact and change in driving-surfaces and consequent speed the front end of shaft L is mounted in a bridge or cross-bar, P, shown in detail in Figs. 4, 5, 6, and 7. The bridge P is provided with a box or bearing, *i*, in which is mounted a cylindrical block, *j*, shown in Figs. 4, 5, and 6, said block *j* being provided with bearings *k*, for the shaft L, eccentric to the block *j*. The block *j* is further provided on its front face with a socket, *l*, for the reception of a hand-lever, *m*, by which the block *j* may be turned or rotated in its bearing *i*, to bring the bearing *k* to one or the other side of the center of the block *j*.

The device being thus constructed operates as follows: Motion being imparted to shaft H through band-wheel I is of course transmitted to the saw through the lower saw-supporting wheel, Q. The hand-lever *m* is now moved so as to bring the friction-wheel M, carried by shaft L, into contact with the small bevel friction-wheel K. The motion imparted to wheel K is transmitted through friction-wheel M, shaft L, gears N O, shaft G, and drum F to the carriage, and causes the proper "feed" of the same. When the cut is completed, the hand-lever *m* is reversed, and the friction-wheel M made to move in contact with the inner face of the friction-wheel J, whereupon a reverse and much more rapid movement of the carriage is effected for "gigging back." The amount of play the friction-wheel M has between the friction-wheels J K is very slight, and only a very slight movement of the hand-lever is required to shift the lever L.

In order to assist in securing and maintaining proper alignment of the shaft L the cross-bar or bridge P is provided at each end with

adjusting-screws *p*. Referring now to Figs. 1, 8, 9, and 10, the mechanism for raising and lowering the guide-arm will be explained. The upright column or standard R is, as usual, made hollow and provided on one face with vertical guides or ways *q*, upon which moves the upper guide-arm, S, the guides *q* and the arm S being dovetailed, as shown. Projecting from the inner face of the guide arm S is a lug, *r*, threaded to receive a screw, *s*, the latter being shouldered and supported at its lower end in any suitable bearing. T indicates a rod connected to the screw *s* by means of a universal joint, *t*, the rod T being provided at its lower end with a bevel friction-wheel, U, as shown in Fig. 9, and supported at a point above the friction-wheel U by a bridge-tree, *u*. The bridge-tree *u* is pivoted at its rear end to a lug projecting from the rear of the upright column R, and extends through said column to the front face thereof. As indicated by dotted lines in Fig. 1, the rod T also extends through the front face of the upright column R, and terminates directly over the shaft H. As shown in Figs. 3 and 8, the shaft H is provided with fixed bevel friction-wheels V and W, between which the friction-wheel U hangs, the latter being arranged to hang freely between and out of contact with both of said wheels or to move in contact with either at will. Of course, if the wheel U should run in contact with wheel V, it would turn the screw *s* in one direction and cause a movement of the guide-arm; but if the wheel U should move in contact with the wheel W it would cause a reverse movement of the screw and guide-arm. The direction of rotation of the shaft H and the threading of screw *s* will of course determine which of the wheels V W will be used to raise and which to lower the guide-arm. As previously stated, and as clearly shown in Fig. 10, the bridge-tree *u*, supporting the shaft T, projects through the front side of the upright column R, where it is connected to a hand-lever, X, by means of a link, *v*, the hand-lever being pivoted at a point above the link to a bracket or support, *w*, rigidly secured to the standard R. It will be seen that as the hand-lever is rocked on its pivot it moves the bridge-tree *u*, and the shaft T, carried thereby, in the direction of the length of shaft H, and will cause the friction-wheel U to come into contact with wheels V or W, according to the direction in which the hand-lever is moved. A spring-dog, *x*, secured to the bracket *w*, engages with the end of the hand-lever X, and holds said lever normally in a vertical position, thus rendering the wheel U inoperative.

Fig. 1 is a side or end view of my improved guide; Fig. 12, a face view partly in section; and Fig. 13, a top plan view. The end of the guide-arm S is provided with a slot or groove, *b'*, extending horizontally across its face, as shown in Fig. 12, the groove being fitted to receive a web or rib, *c'*, formed upon the rear face of a plate, A', secured to the guide-arm S by means of a bolt, *y*, from which it will be seen that the entire guide Y may be moved laterally across the end of the guide-arm. The bolt *y* is provided with an enlarged head, as shown in Fig. 13, and projects through a slot. (Shown in dotted lines in Fig. 12 in the guide-arm.) The plate A' is provided with a laterally-extending arm, *d'*, and with a horizontal plate, *e'*, the former having at its end a bolt, *f'*, and the latter having a bolt, *g'*. The horizontal plate *e'* is countersunk or recessed on its under face around the bolt *g'*, to form a circular socket, *h'*, to receive a hub or boss, *i'*, formed upon the upper face of a plate, *j'*, secured to the plate *e'* by means of the bolt *g'*. This plate *j'* is formed with a laterally-extending arm, *k'*, corresponding to and beneath the arm *d'* of plate A', and said arm *k'* is formed with a curved slot, *l'*, through which and the arm *d'* the bolt *f'* passes, as shown in Figs. 11, 12, and 13. The sides or edges *j'* are beveled, as shown in Fig. 12, and slide in guides or ways formed upon the main portion of the guide.

Projecting from the guide Y, beneath the arm S, is a lug, *m'*, in which is swiveled the shank of a screw, *n'*, provided with a hand-wheel, B', at one end, and screwing at the other end into a lug, *o'*, formed upon the under side of the plate *j'*, as shown in Figs. 11 and 13 and by dotted lines in Fig. 12. From this construction it will be seen that by turning the hand-wheel B' in one or the other direction the guides on the inner face of the saw may be moved to and from the latter, as desired. The outer portion of the guide Y is formed of two sections, Z and *z*, as shown in Fig. 12, the upper section, Z, being formed with a downwardly-projecting ear or lug, *p'*, through which passes a screw, *q'*, having at one end a hand-wheel, C', by which it may be turned. The upper section, Z, is dovetailed into the lower section, *z*, as shown in Fig. 11, and is adjustable longitudinally upon the latter by means of the screw *q'*, which screws into a lug, *r'*, on the section *z*, as shown in dotted lines in Fig. 12. This adjustment enables the lower section, *z*, of the guide, or the block *a²*, carried thereby, to be moved closer to or farther from the rear edge of the saw, and also to compensate for wear of the block. Now, should it be found that the guiding-blocks *a'* were not parallel with the face of the saw, they could not be made so by the adjustment of either of the screws *n' q'*, as both of said screws move the guide-sections in fixed predetermined right lines. To accomplish or secure this parallelism it is only necessary to loosen the bolts *f' g'* and turn the plate *j'* upon the bolt *g'* as a pivot until the guiding-blocks are parallel with the face of the saw, whereupon the bolts *f' g'* may be tightened and the plate held in position. The upper arm, Z, extends outward beyond the lower arm, *z*, and supports the saw near the cutting-edge, while the lower arm, *z*, supports the inner face or side walls of the saw. Each of the arms Z and *z* is provided with a tapering dovetailed socket, in which is driven.

a block, a', of wood, preferably lignum-vitæ. As these blocks a' are beveled on their edges and taper lengthwise, they can be fitted quite easily with a plane and driven tightly to their seat. When once driven, they need no fastening screws or bolts or other securing devices.

In using the term "gear" I do not wish to be understood as limiting myself to the use of toothed or friction gear, as it is obvious that either these or other forms of gearing may be used with equal advantage.

I do not in this application claim the construction of the upper saw-supporting wheel, as this feature will form the subject-matter of a separate application, to be filed as a division of the present case.

Having thus described my invention, what I claim is—

1. In combination with main shaft H and gear-wheels J K thereon, saw-carriage-operating shaft G, a gear-wheel, O, thereon, and shaft L, provided at one end with a gear, N, to mesh with wheel O, and at the other end with a gear, M, to run in contact with either of the wheels J K at will, whereby the shaft L may be rotated in one or the other direction, according as it is desired to "feed" or to "gig".

2. In combination with shaft H and gears J K, of different diameters, mounted thereon, carriage-operating mechanism, and shaft L, connected at one end to the carriage-operating mechanism, and adapted, substantially as shown and described, to have motion imparted to it by either of the wheels J K at will, whereby a differential speed of the carriage is secured.

3. In a band-saw mill, in combination with a main driving-shaft, H, and a carriage-operating shaft, G, both mounted in fixed bearings, an intermediate shaft, L, to communicate motion from the shaft H to shaft G substantially in the manner shown, a cross-bar, P, and an eccentric bearing for the shaft L at the end nearest the main shaft mounted in the cross-bar.

4. In a band-saw mill, the combination, with the main shaft H and a carriage-operating shaft, G, of an intermediate connecting shaft, L, a cross-bar, P, provided with a bearing, i, a block, j, mounted and rotatable in said bearing, an eccentric bearing, k, for the shaft L, and a hand-lever, m, secured to the block j, adapted and arranged to rotate or rock the latter and move the shaft L laterally, as and for the purpose set forth.

5. In a band-saw mill, in combination with an upright or standard, a guide-arm moving on ways thereon, a screw for raising and lowering said guide-arm, a gear-wheel for imparting motion to said screw, a main shaft, gear-wheels secured rigidly thereon, and a hand-lever for throwing the gear on the screw-stem into engagement with either of the gears on the main shaft at will.

6. In a band-saw mill, the combination, with a shaft provided with two bevel-gears, of a vertically-adjustable saw-guide arm provided with a bevel gear-wheel between the two bevel-gears on the main shaft, and a hand-lever or its equivalent, arranged substantially as shown, to cause the gear-wheel to mesh with either of those on the main shaft at will.

7. In a band-saw mill, the combination of standard R, guide-arm S, movable thereon, screw s, for raising and lowering the guide-arm, a rod, T, connected to screw s by means of a universal joint, a bridge-tree, u, supporting-rod T, a gear, U, on the end of the rod, main shaft H, gears V W thereon on opposite sides of gear U, and a hand-lever, X, for moving the bridge-tree u laterally, as and for the purpose set forth.

8. In a band-saw mill, the combination, with the standard, the guide arm, and the mechanism for raising and lowering the guide-arm, of the pivoted bridge-tree u, a hand-lever, X, connected with the bridge-tree, and a locking device, as x, for holding said lever in any desired position.

9. In a band-saw mill, the combination, with an upright column, R, of a guide-arm, S, projecting laterally therefrom, a slotted groove, b', across the outer end of the guide-arm, a saw-guide, Y, provided with a vertical plate, A', and a bolt, y, passing through the plate and slotted groove, substantially as shown, and for the purposes set forth.

10. In a band-saw mill, the combination, with a guide-arm, as S, of a plate, A', secured to the end thereof, a saw-guide, Y, secured to the plate by means of a vertical pivot, g', and capable of rotating horizontally thereupon, the guide being composed of the parts Z z, adapted to slide one upon the other, substantially as described.

11. In a band-saw mill, the combination, with an arm, as S, of a plate, A', secured thereto, provided with a horizontal plate, e', and an arm, d', plate j', secured to plate e' by means of a bolt, g', and connected to the saw-guide, whereby the guide may be swung about the bolt g' as a pivot to bring the guide-blocks parallel with the face of the saw.

12. In a band-saw mill, the combination of an arm, as S; a plate secured thereto provided with arm d' and horizontal plate e'; a plate, j', secured to the latter by a bolt, g'; a socket, h', in the under face of plate e', around the bolt g'; a plate, j', formed with a hub or boss, i', to fit into said socket h'; an arm, k', secured to plate j', and a bolt, f', passing through the arms d' k', as and for the purpose set forth.

13. In combination with a band-saw mill, the guide-arm S, saw-guide Y, comprising the parts Z and z, a screw, n', adapted to move the guide to and from the face of the saw, and a screw, q', swiveled in the part Z and adapted to move the same upon the part z.

GEORGE M. HINKLEY.

Witnesses:
WM. W. ALLIS,
EDW. P. ALLIS, Jr.