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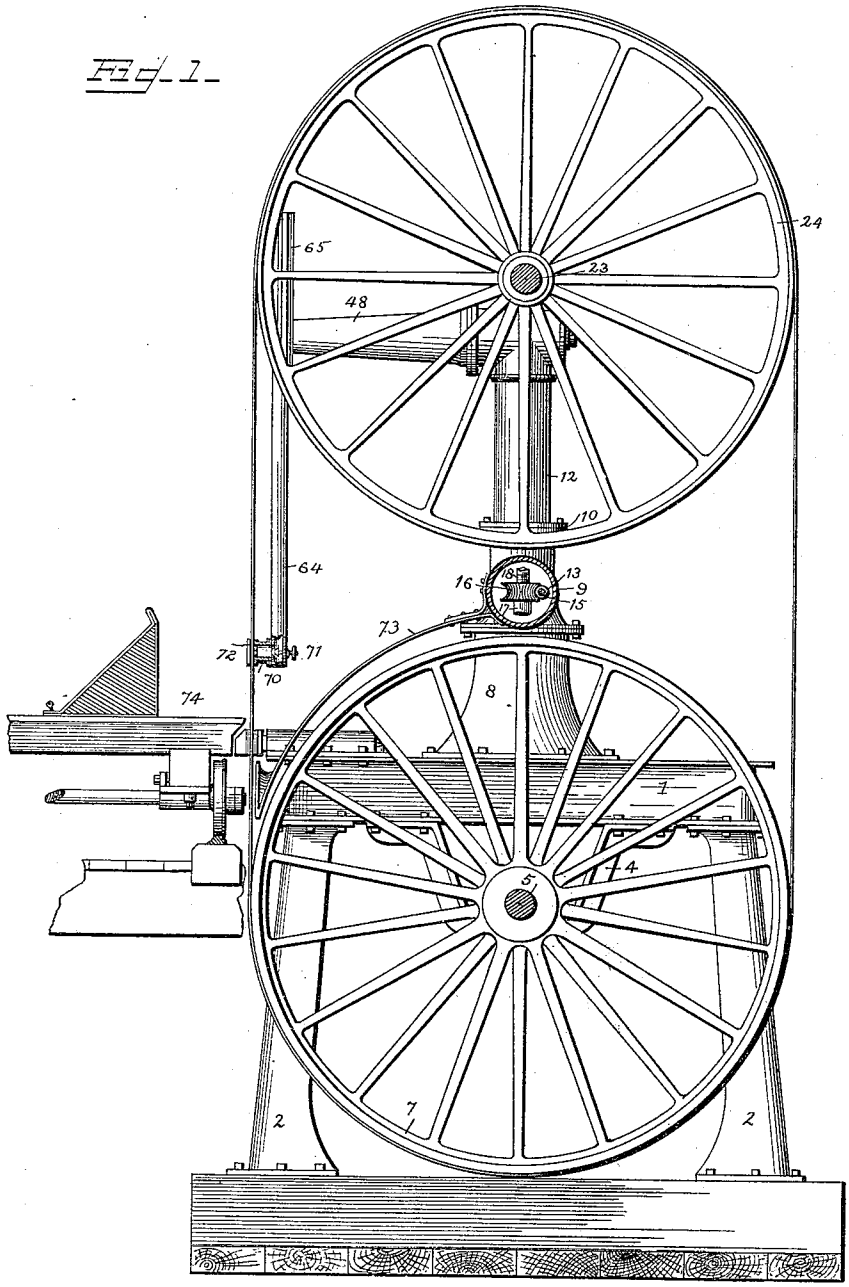
4 Sheets—Sheet 1.

I. N. KENDALL.

BAND SAW MILL.

No. 447,953. Patented Mar. 10, 1891.

Fig. 1.



Witnesses
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Wm. Bagger.

Inventor
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By his Attorneys.
C. A. Snow & Co.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

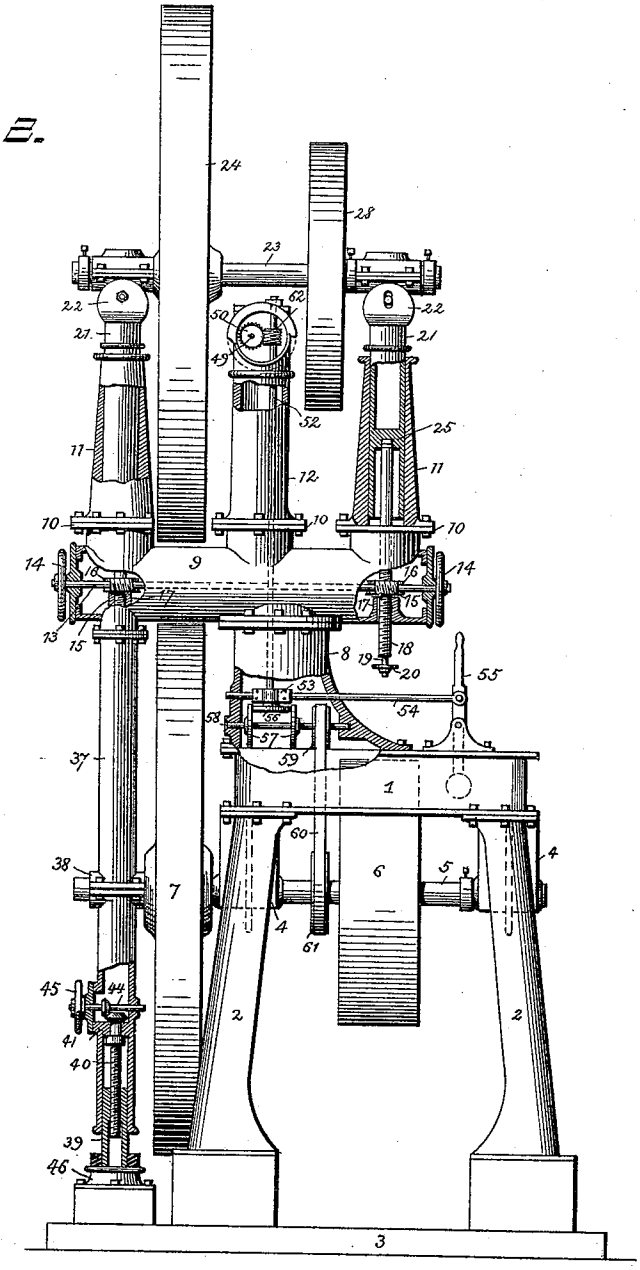
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Fig. 2.



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Fig. 3.

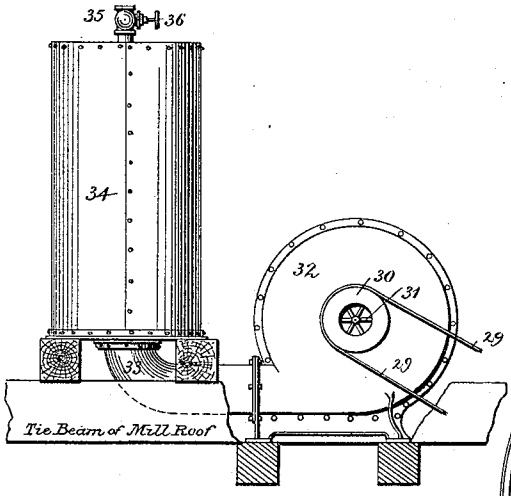


Fig. 4.

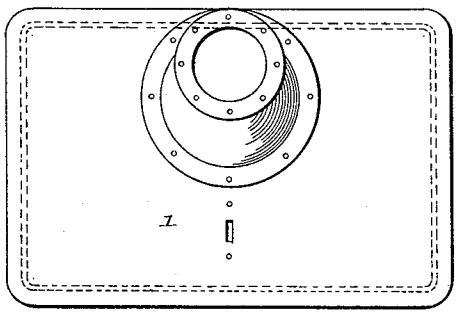
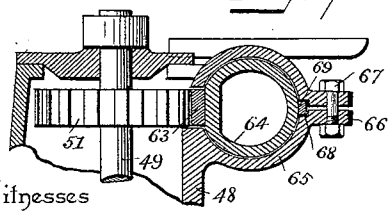
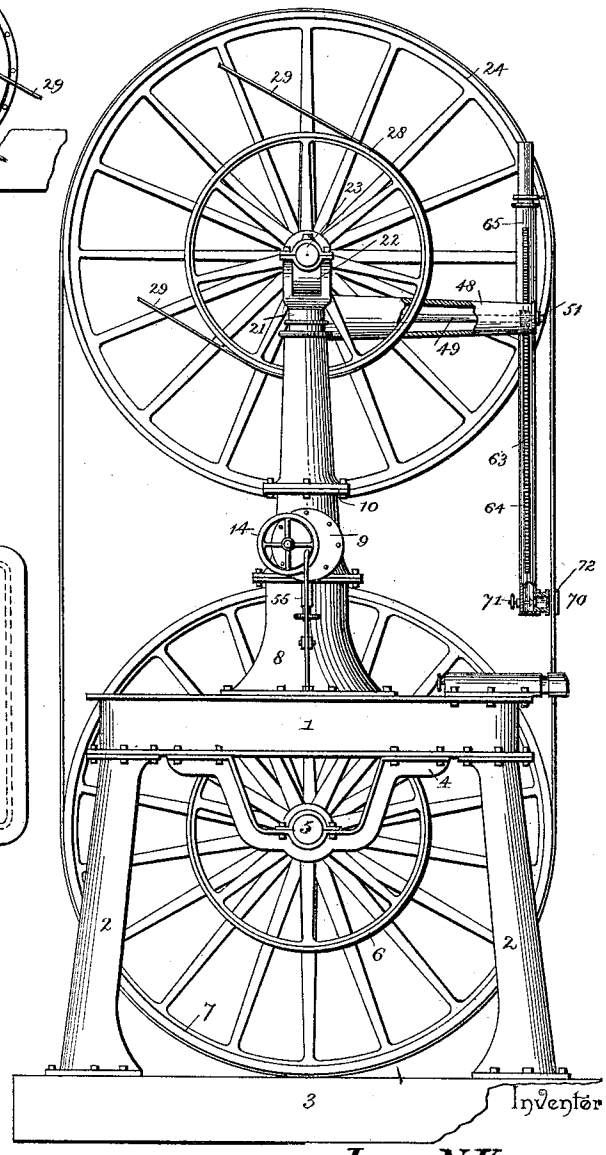


Fig. 7.





Witnesses

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(No Model.) 4 Sheets—Sheet 4.

I. N. KENDALL.

BAND SAW MILL.

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Fig. 5.

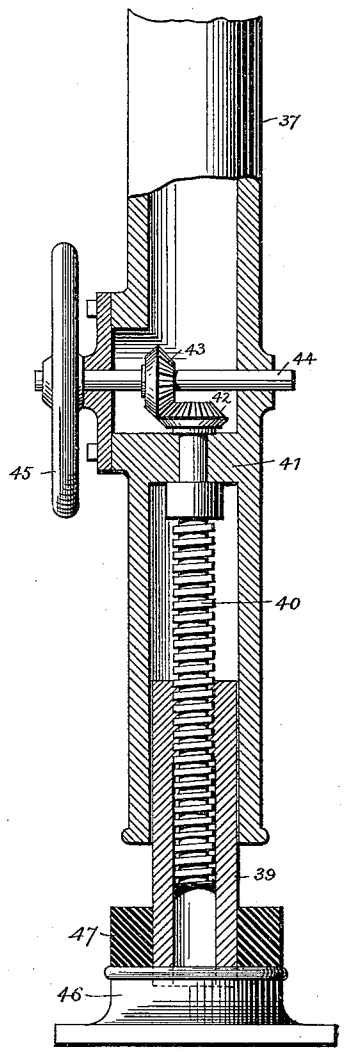


Fig. 6.

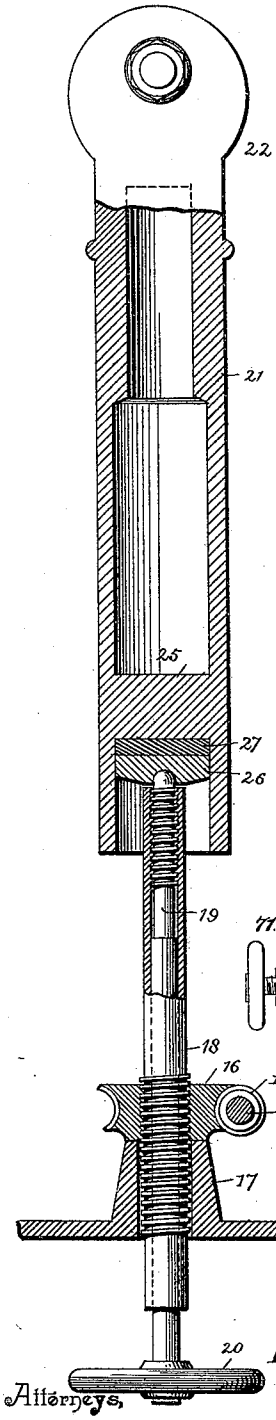
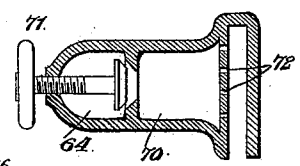


Fig. 8.



Witnesses
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UNITED STATES PATENT OFFICE.

ISAAC NEWTON KENDALL, OF NEW WESTMINSTER, CANADA.

BAND-SAW MILL.

SPECIFICATION forming part of Letters Patent No. 447,953, dated March 10, 1891.

Application filed April 11, 1890. Serial No. 347,477. (No model.)

To all whom it may concern:

Be it known that I, ISAAC NEWTON KENDALL, a citizen of the Dominion of Canada, residing at New Westminster, in the Province of British Columbia, Canada, have invented a new and useful Band-Saw Mill, of which the following is a specification.

This invention relates to band-saw mills; and it has for its object to construct a machine of this class in which objections which are common to band-saw mills of ordinary construction shall be overcome.

In order to construct an efficient band-saw, it is necessary that the upper wheel supporting the saw shall be made quite heavy in order to secure the necessary strength. This fact, taken in connection with the fact that the said upper drive-wheel must be of large diameter, practically makes a fly-wheel thereof. The result is that when the saw enters the cut and the other parts of the machine are retarded or their speed slackened in proportion to the resistance to the cutting of the saw the momentum of said top wheel carries the saw onward and causes a slackness in the saw just at the point where it should be kept as taut as possible. To obviate this advantage and to prevent danger of the saw breaking on the side opposite the cutting side by being overstrained by the momentum from the top wheel, I propose to provide a rotary blower driven from the shaft of the upper saw-carrying wheel and forcing air into a receiver having means for regulating the exit of the air therefrom. The pressure of the air contained in said receiver will react upon the rotary fan, which, being driven from the shaft of the upper saw-carrying wheel, serves to retard the latter to an extent proportionate to the pressure of the air in the receiver, which may be easily regulated.

A further object of my invention is to provide the frame of the machine with an outside column or support serving to steady the frame during the operation of the machine, said column or support being so constructed as not to interfere with the removal or adjustment of the saw.

A further object of my invention is to provide improved mechanism whereby the saw may be automatically lubricated at the will of the operator.

My invention further consists in the improved construction, arrangement, and combination of details, which will be hereinafter fully described, and particularly pointed out in the claims.

In the drawings, Figure 1 is a front elevation of a band sawing-machine embodying my improvements, parts of the same being shown in section. Fig. 2 is a side elevation, partly in section. Fig. 3 is a rear elevation, likewise shown partly in section. Fig. 4 is a plan view of the platform. Fig. 5 is a sectional view, on a larger scale, of the lower end of the supporting-column. Fig. 6 is a sectional view, on a larger scale, of part of the adjusting mechanism for the upper shaft. Fig. 7 is a detail horizontal sectional view of the saw-guide-lubricating tube. Fig. 8 is a detail sectional view of the saw-guide and the valved lubricating-channel.

Like numerals of reference indicate like parts in all the figures.

1 designates the platform of the machine, which is mounted by means of legs or supports 2 upon a suitably-constructed foundation 3. The said platform is provided on its under side with hangers 4, in which is mounted the shaft 5, carrying the band-wheel 6, by means of which the machines receive motion from suitable operating mechanism. The shaft 5 also carries the lower supporting-wheel 7 of the saw.

Suitably bolted upon the upper side of the platform 1 is a tubular support 8, to the upper end of which is bolted a horizontal tubular support 9, the upper side of which is provided with flanges 10, to which are bolted the vertical tubular uprights or supports, the outer ones of which are designated by 11 11, and the central one of which is designated by 12.

The horizontal tubular support 9 is provided near its ends with bearings for a horizontal longitudinal shaft 13, the outer ends of which are provided with hand-wheels 14, by means of which it may be operated. The shaft 13 is provided with worms 15, engaging worm-wheels 16, which are mounted revolubly upon supports 17. The latter are perforated vertically for the passage of the exteriorly-screw-threaded rods 18, which are engaged by threads cut interiorly in the

worm-gears. It will thus be seen that by rotating the latter the screw-threaded rods 18 will be vertically adjusted simultaneously and to an equal extent. The screw-threaded rod extending through the worm-gear at the rear end of the machine is tubular in shape and is interiorly screw-threaded at its upper end. Through the said tubular rod extends a rod 19, the lower end of which is provided with a hand-wheel 20, and the upper end of which is exteriorly threaded to engage the interiorly threaded upper end of the tubular rod 18.

The tubular standards 11, mounted upon the support 10 at the ends of the latter, are provided at their upper ends with telescopic extension-pieces 21, the upper ends of which have the pivoted boxes 22, that form bearings for the shaft 23, carrying the upper wheel 24, which, together with the lower wheel 7, serves to support the band-saw. The extension-pieces 21 are provided near their lower ends with diaphragms 25, against which are placed the wrought-iron followers 26, between which and said diaphragms packing-cushions 27, of rubber or other suitable elastic material, are interposed. The upper ends of the adjusting-screws 18 bear against the followers 26 and serve to support the adjustable extension-pieces carrying the top shaft of the mill. It will be observed that by the mechanism described the said top shaft may be raised or lowered as occasion may demand; also, that by means of the adjusting-screw 19 within the adjusting-screw 18 the rear end of the top shaft may be adjusted independently of the front end of the latter, thereby enabling it to be leveled or tilted, as may be desired.

The upper shaft 23 carries a band-wheel 28, which is connected by a belt or band 29 with the drum 30 upon the end of the shaft 31 of a rotary fan of ordinary construction, which is inclosed in a casing 32, the outlet of which is connected by the pipe 33 with the receiving-tank 34, which is provided with a valved outlet 35. The valve 36 of said outlet serves to regulate the escape of the air from the receiving-tank, and the pressure in the latter may thus be regulated. This pressure naturally reacts against the revolving fan and checks or retards the latter to any desired extent. Said fan, being driven from the top shaft 23, acts as a brake to the latter, and the momentum of the wheel 24 upon the said shaft may thus be very accurately regulated and controlled.

The outer or front end of the horizontal tubular support 9, which supports the greater part of the weight of the top shaft 23 and the wheel 24, is in turn supported by a tubular column 37, which is provided with a suitably-located box or bearing 38 for the outer or front end of a shaft 5, which is thus supported, in addition to its bearings, in the hangers or brackets 4 upon the under side of the platform of the frame. The lower end of the tubular column is bored to receive a sliding extension or foot piece 39, which is interiorly screw-threaded to receive an adjusting-screw 40, the upper end of which is swiveled in the diaphragm 41 in the column 37. The adjusting-screw 40 is provided above the said diaphragm with a bevel-pinion 42, meshing with a correspondingly-mitered pinion 43 upon a shaft 44, journaled transversely in the column 37, and provided at its outer end with a hand-wheel 45, by means of which it may be conveniently manipulated. The lower end of the extension-piece 39 is seated in a supporting-socket 46, and it is provided above said socket with a ring 47, of lead or other suitable material, which in the event of the saw accidentally slipping off its carrying-wheels will prevent the teeth of the saw from coming into contact with the cast-iron portion of the column. It will be observed that by means of the hand-wheel 45 the adjusting-screw 40 may be manipulated so as to raise the extension-piece 39 when it shall be desired to remove the saw from its carrying-wheels and to substitute another one.

The vertical tubular support 12 is provided at its upper end with a laterally-extending tubular arm 48, in which is journaled a horizontal shaft 49, provided near its inner end with a worm-wheel 50 and near its outer end with a pinion 51.

52 designates a vertical shaft, the upper end of which is journaled in a suitable bearing in the upper end of the tubular casing 12 in such a manner as to permit the lower end of said shaft to be slightly vibrated. The lower end of said shaft is journaled in a box 53, attached to a rod 54, which is mounted to slide horizontally in suitable bearings upon the tubular support 8. The outer end of the sliding rod 54 is connected pivotally with a hand-lever 55, the lower end of which is weighted so as to keep the said lever normally in a vertical position. The lower end of the shaft 52 is provided with a friction-disk 56, the normal position of which is between a pair of friction-disks 57, mounted upon horizontal shafts 58 and out of contact with either. The shaft 58, which is provided with a belt-pulley 59, receives motion by a belt or band 60 from a band-wheel 61 upon the main driving-shaft 5. It will be seen that by manipulating the lever 55 the lower end of the shaft 52 may be adjusted to place the friction-disk 56 in contact with either one of the friction-disks 57, thereby causing the shaft 52 to be rotated in any desired direction.

The upper end of the shaft 52 carries a worm 62, that meshes with the worm-gear 50 upon the shaft 49. The pinion 51 at the outer end of said shaft engages a rack-bar 63, which is formed or secured on one side of a tube 64, which is mounted to slide vertically in a guide-sleeve 65, which is formed or secured upon the outer end of the horizontal tubular supporting-arm 48. The said guide-sleeve is slotted vertically and is provided with flanges 66, which are connected by means of bolts 67,

thereby enabling said guide-sleeve to be clamped upon the vertically-sliding tube sufficiently to compensate for wear. The slotted side of the guide-sleeve is provided with a groove 68 to accommodate a feather 69, which is suitably attached to the vertically-sliding tube for the purpose of holding the latter from turning.

The lower end of the vertically-sliding tube 64 is provided with the laterally-extending arm or bracket 70, which forms the saw-guide. This arm or bracket has a channel formed therein, which communicates with the lower end of the tube 64, and said channel, which is provided with a valve 71, terminates in openings communicating with the vertical slot 72, in which the saw is guided. In operation the tube 64 is filled with lubricating material, which is thus continually and automatically supplied to the saw, the quantity of the supply being regulated by means of the valve 71.

73 designates the ordinary guard-plate, and 74 the carriage, in the construction of which no novelty is claimed.

From the foregoing description, taken in connection with the drawings hereto annexed, the operation and advantages of my invention will be readily understood. When the machine is in operation, the rotary fan driven from the upper saw-shaft will serve to force air into the receiver provided for the purpose, and the pressure in said receiver may be easily and accurately regulated by means of the escape-valve. The pressure, being thus caused to react upon the rotary fan and the upper saw-shaft, will prevent the momentum of the saw-carrying wheel upon said upper saw-shaft from interfering injuriously with the operation of the machine.

The supporting-column 37, while it serves a very important and useful purpose of steadying the machine and preventing excessive vibration during the operation, does not interfere with the adjustment or removal of the saw, owing to its peculiar construction, by means of which the extension-piece at its lower end may be temporarily raised from its supporting-socket.

By the mechanism described the saw-guide may be quickly and easily raised or lowered to any desired position, and by its peculiar construction the saw may be continuously and automatically lubricated, the supply of lubricating material being completely within the control of the operator.

The general construction of the machine is simple and of such a nature as to render it exceedingly strong and durable.

The mechanism provided for adjusting the various parts is simple and convenient and of such a nature as to permit an exceedingly-accurate adjustment of all the parts of the machine.

Having thus described my invention, I claim—

1. In a band-saw mill, the combination, with the upper saw-shaft, of the vertically-adjustable supports for the same, the adjusting-screws, the interiorly-threaded worm-wheels engaging the said adjusting-screws, a shaft provided with hand-wheels and with worms engaging the said worm-wheels, and an independent adjusting-screw extending vertically through the adjusting-screw supporting the rear end of said shaft and having a hand-wheel at its lower end, substantially as set forth.

2. The combination, in a band-saw mill, with the upper saw-shaft, of the tubular supporting devices, the supports mounted to slide vertically therein and having diaphragms at their lower ends, the wrought-iron followers and interposed elastic cushions placed against the under sides of said diaphragms, and the adjusting-screws arranged to bear against the said followers, as set forth.

3. In a band-saw mill, the combination, with the frame, of a vertical supporting-column arranged outside the lower saw-carrying wheel and having a bearing for the shaft of the latter, and having a vertically-movable foot-piece, which may be raised to permit the removal of the saw, substantially as set forth.

4. In a band-saw mill, the combination, with the frame, of a vertical supporting-column arranged outside the lower saw-carrying wheel and having a vertically-movable foot-piece, which may be raised to permit the removal of the saw, substantially as set forth.

5. In a band-saw mill, the combination, with the frame, of the vertical supporting-column arranged outside the lower saw-carrying wheel and having a vertically-movable foot-piece provided with a guard-ring of lead or analogous material, substantially as set forth.

6. In a band-saw mill, the combination, with the frame, of the vertical supporting-column arranged outside the lower saw-carrying wheel and having a vertically-adjustable foot-piece, which may be raised to permit the removal of the saw, and a supporting-socket for the said foot-piece, substantially as set forth.

7. In a band-saw mill, the combination, with the frame, of the tubular supporting-column arranged outside and adjacent to the lower saw-carrying wheel and having a diaphragm at its lower end, an adjusting-screw swiveled in said diaphragm, a tubular extension-piece screw-threaded interiorly to engage said adjusting-screw, and means for operating the latter, substantially as set forth.

8. In a band-saw mill, the combination, with the vertically-adjustable saw-guide having a rack-bar, of means for adjusting the said saw-guide, comprising a horizontal shaft provided at one end with a pinion to engage said rack-bar and at the other end with a worm-wheel, a vertical shaft having a worm at its upper end meshing with said worm-wheel, a laterally-movable slide having a box or bearing for the lower end of said vertical shaft, a horizontal friction-disk at the extreme lower end

of said vertical shaft, a horizontal shaft driven from the lower saw-shaft and having a pair of friction-wheels located on opposite sides of the friction-disk at the lower end of the vertical shaft, and a vertical hand-lever connected pivotally with the laterally-movable slide-bar and weighted at its lower end to hold the friction-disk at the lower end of the vertical shaft normally out of contact with the friction-wheels upon the horizontal shaft, substantially as set forth.

9. In a band-saw mill, the combination of a vertical tubular support having a laterally-extending tubular arm, a guide-sleeve at the outer end of the latter, the vertically-movable tube mounted in said guide-sleeve and forming a receptacle for lubricating material, mechanism for adjusting the said tube in either upward or downward direction, and the saw-guide at the lower end of said tube, having perforated faces communicating with the interior of said tube or receptacle, substantially as set forth.

10. The combination, with the vertically-slotted guide-sleeve having flanges adjacent to the slot therein, of the vertically-movable tube carrying the saw-guide, the feather upon the latter engaging a groove in the slotted side of the guide-sleeve, the clamping-bolts connecting the flanges of the said tube, the rack-bar upon the vertically-movable tube, and adjusting mechanism for the latter, substantially as set forth.

11. In a band-saw mill, the combination, with a vertically-adjustable tube to form a receptacle for lubricating material, of the saw-guide at the lower end of said tube and the valved channel in said saw-guide, substantially as and for the purpose set forth.

12. In a band-saw mill, a vertically-adjustable saw-guide mounted upon a tubular receptacle and having a valved channel connecting the escape-openings in said saw-guide with the said receptacle, substantially as and for the purpose set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

ISAAC NEWTON KENDALL.

Witnesses:

HERBERT S. ROSS,

C. C. WORSFOLD.