

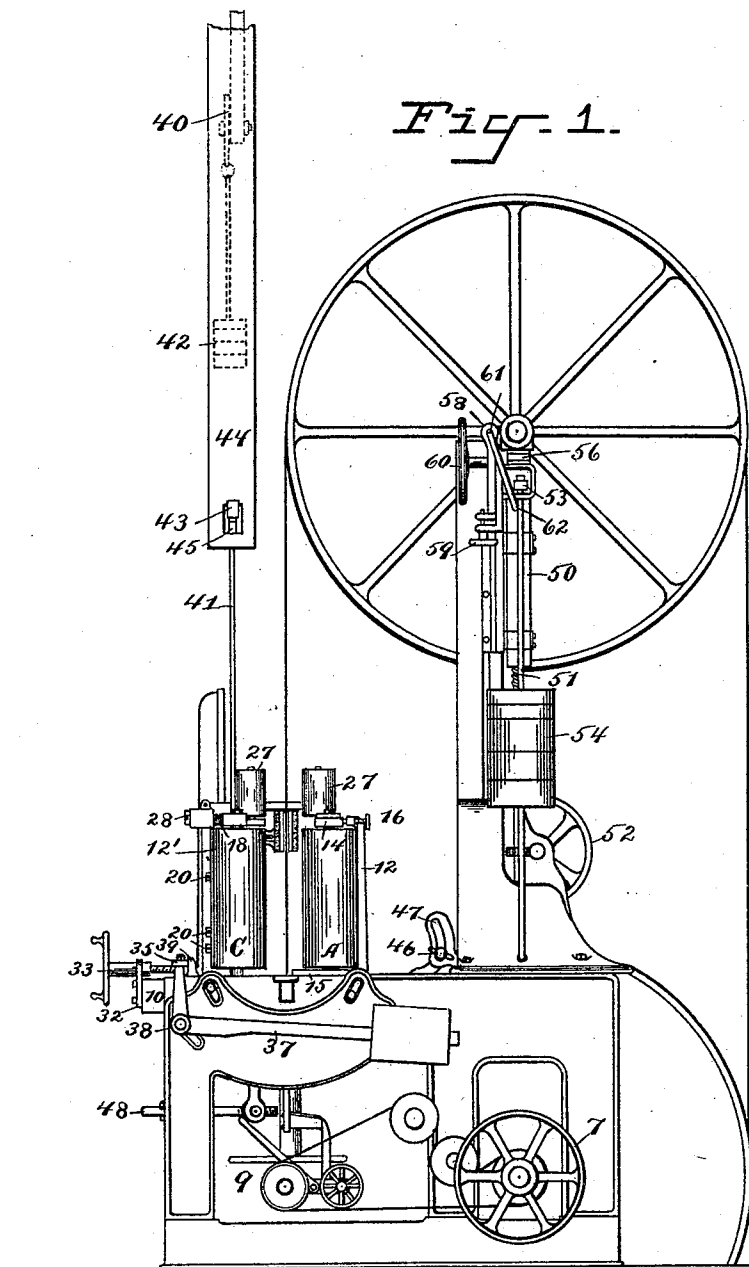
(No Model.)

4 Sheets—Sheet 1.

E. C. MERSHON.
BAND RESAW.

No. 538,688.

Patented May 7, 1895.



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Fig-2.

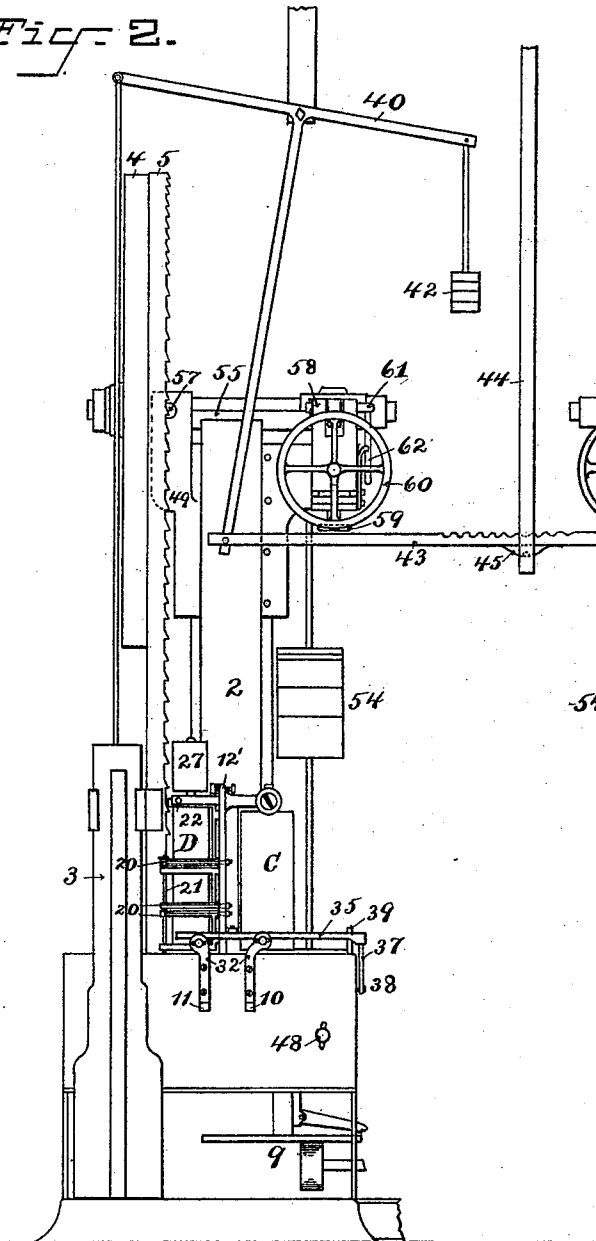


Fig-3.

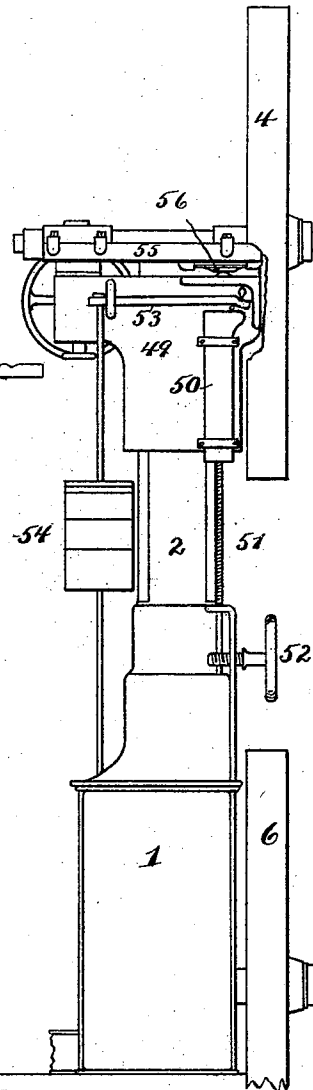
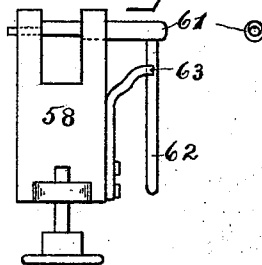


Fig-7.



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Fig. 4.

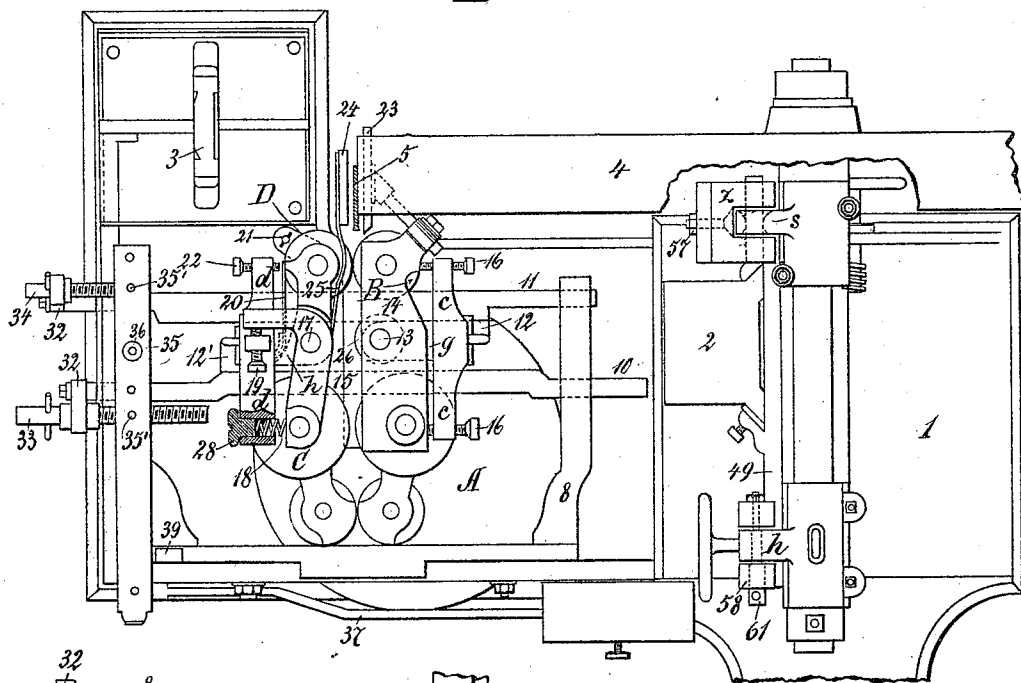


Fig. 6.

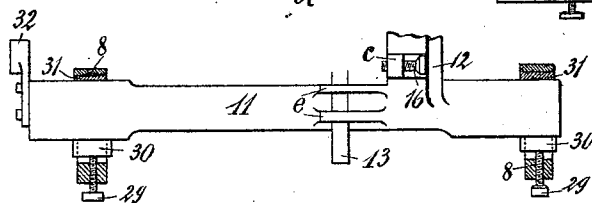
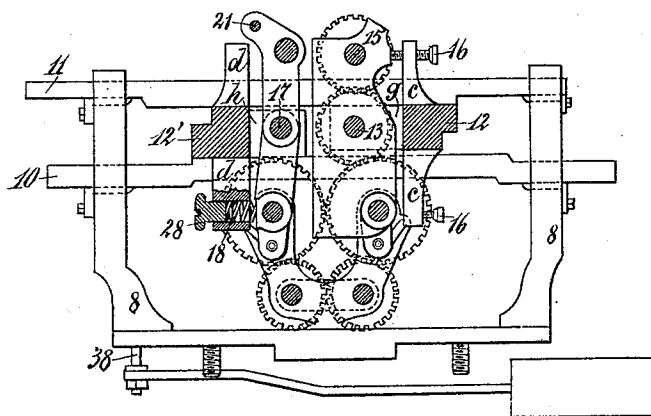


Fig. 5.



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Fig. 8.

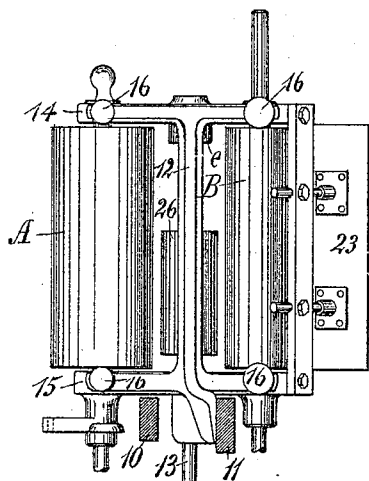


Fig. 9.

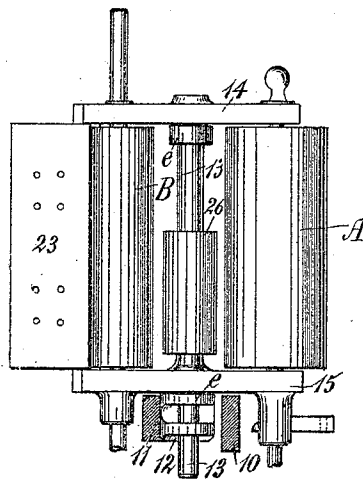


Fig. 10.

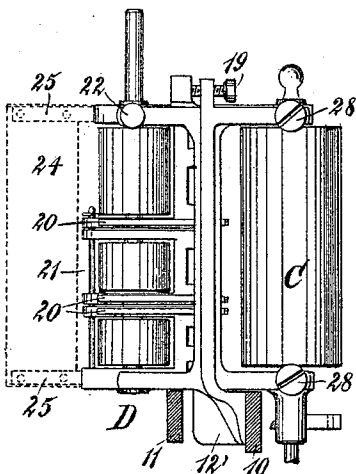


Fig. 11.

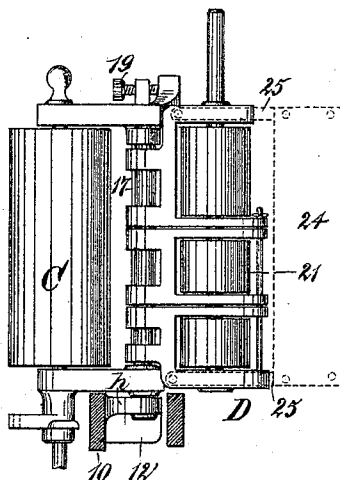
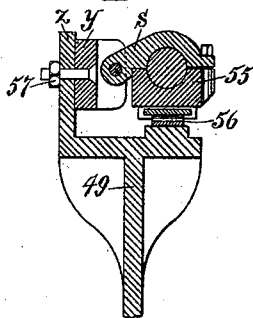


Fig. 12.



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UNITED STATES PATENT OFFICE.

EDWARD C. MERSHON, OF SAGINAW, MICHIGAN.

BAND-RESAW.

SPECIFICATION forming part of Letters Patent No. 538,688, dated May 7, 1895.

Application filed May 8, 1894. Serial No. 510,459. (No model.)

To all whom it may concern:

Be it known that I, EDWARD C. MERSHON, a citizen of the United States, and a resident of Saginaw, in the county of Saginaw and State of Michigan, have invented a certain new and useful Band-Resaw, of which the following is a specification.

My invention relates to sawing machines using band-saws, and particularly to those of this class which are used in resawing lumber and are commonly termed band-resaws.

My present invention is in the nature of improvements in the details of my band resaw which is the subject of United States Patents Nos. 503,768 and 505,080, granted respectively August 22, 1893, and September 12, 1893.

Self-adjusting feeding rollers have heretofore been used but generally they have been mounted upon short gibs or slides located at either side of the saw and intended to move to and from the saw in response to variations in the thickness of the lumber. On account of the shortness of these slides, pressure unevenly distributed on the vertically extending feeding rollers causes them to bind and fail to adjust themselves satisfactorily. This objection I overcome by mounting the feeding rollers upon slides made to extend entirely across the bed of the machine so that there is no possibility of their binding in their seats, no matter where the pressure upon the rollers may occur. This also places the contact surfaces of the slides out of the line of the sawdust and gum from the saw which enables them to be easily kept clean and in perfect operating condition. I am also enabled to place these long slides entirely out of the reach of the saw thereby avoiding damage to the saw which frequently arises in the use of the short slides or gibs. I also so mount the feeding rollers that, in their self-adjustment, they will present lumber above the average thickness to the saw in a manner to divide it equally and lumber below the average thickness they will present in a manner such that one of the pieces produced will be of the required thickness. I provide also in connection with the upper band wheel a sensitive self-acting tension device that will respond quickly to any sudden strain upon the saw and that will cause the same to become taut again immediately upon the cessation of such

strain. In connection with said tension device I also provide a cross-lining device for changing the position of the saw upon the band wheels.

My invention, therefore, consists in mounting the feeding rollers upon slides that extend across the line of cut from one side to the other of the bed of the machine and have their bearings or guides out of the path of the dust and gum from the saw.

It also consists in a self-adjusting mechanism for the feeding rolls so constructed that said rolls shall be self-centering or shall automatically equalize the distance between themselves and the saw when required and shall also divide it unequally when required.

My invention further consists in combining with the usual tension for the same, a supplemental sensitive tension device which shall operate upon the bearing for the upper band wheel to compensate for sudden strains upon the saw.

It further consists in a cross-lining device consisting of a cam operating upon the hinged bearing for the upper band wheel.

My invention further consists in the construction and combination of parts herein-after described and pointed out in the claims.

In the accompanying drawings, which form a part of this specification, Figure 1 represents a front elevation of my band-resaw. Fig. 2 represents a side elevation looking toward the feed-rolls, portions of the driving mechanism being broken away. Fig. 3 represents an elevation of the opposite side of the machine, the same parts being broken away as in Fig. 2. Fig. 4 represents, on an enlarged scale, a plan view, a portion of the upper band-wheel being broken away and also the driving mechanism. Fig. 5 represents, on the same scale as Fig. 4, a horizontal section taken on a plane at the base of the feeding-rolls and showing the bed of the machine. Fig. 6 represents a vertical section through the tilting frame, illustrating the manner of adjusting the slides which carry the feeding-rolls. Fig. 7 is a detail view representing the cross-lining device for the upper band-wheel shaft. Figs. 8 and 9 are side views of the feeding-rollers A and B and of their frames as seen when looking, respectively, to the left and to the right as they appear in Fig. 4. Figs. 10

and 11 are side views of the feeding-rollers C and D and their frames as seen when looking, respectively, to the right and to the left as they appear in Fig. 4. Fig. 12 is a vertical transverse section through a hinge for the web carrying the upper band-wheel shaft.

In the drawings, 1, represents the main frame of the machine from which arises the larger column 2, for the support of the upper band wheel and its appurtenances and the smaller column 3, for the support of the upper saw guide.

4, represents the upper band wheel; 5, the saw, and 6 the lower band wheel mounted on the main shaft with the driving pulley 7.

In this machine as in the original machine represented in Patent No. 503,768, the feeding rolls are carried on a tilting frame 8, mounted in the main frame and the motion is transmitted to said feeding rolls through friction gearing represented at 9, which gearing is the same as that shown in said patent. Through the tilting frame the slides 10 and 11, pass parallel to one another and are located in guides or recesses formed in the sides of said frame. From the slide 11, arises a projection 12, for the support of one pair of feeding rolls, and from the slide 10, arises a similar projection 12' for the support of the other pair of feeding rolls. In lugs *e* on the projection 12, is secured a king bolt 13, at the upper end of which is secured the cross piece 14, which furnishes the upper bearings for the feed rolls A and B, the lower bearings for said rolls being located in a similar cross piece 15, also pivoted upon said king bolt. The cross piece 15, however, is wider than the cross piece 14, so as to project beyond the rolls sufficiently to form a rest for the lumber being re-sawed. Upon the projections or posts 12 and 12', at top and bottom are laterally extending arms *c* and *d*, respectively. In the ends of the arms *c* are located set screws 16, which bear upon the ends of the cross pieces 14 and 15. By these set screws the feeding rolls A and B, are adjusted into parallelism with the line of cut or, in other words, with the plane of the cutting portion of the saw. In lugs *h* extending from the projection 12', is located a king bolt 17, upon which are hinged the frames carrying the feed rolls C, D. In the ends of the forward arms *d*, are located springs 18, which bear against the frame carrying roller C. These springs force this roller against the lumber being sawed. To limit the inward swing of roller C, a set screw 19, is passed through the upper end of projection 12' and bears against a lug formed on the upper portion of the frame carrying roller C.

Roller D, is what is known as a broken or sectional roller. Each portion or section of said roll is mounted in a frame hinged upon the king bolt 17. These frames are pressed against the lumber by means of plate springs 20, bearing against the outer ends thereof which springs are bolted to the projection 12'.

To limit the swing of these frames a projection is formed on each at the rear of the king bolt 17, which projection shall bear against the plate springs 20, near their point of attachment.

The sections of the broken roll may be coupled together so as to cause them to act as a single roll by passing a pin as 21, through apertures formed in the frames of said sections. When thus united the swing of the roll away from the lumber may be limited and regulated by means of a set screw 22, which passes through the upward rearward arm *d*.

In Fig. 4, I have shown at 23, guide plates which support the lumber at the sides of the saw as fully shown and described in my Patent No. 505,080.

In resawing thin material I find it advisable to locate a guide plate on the opposite side of the saw as shown at 24. This plate I support upon the frames of the broken roll by means of plate springs 25, substantially as shown in full lines in Fig. 4, and in dotted lines in Figs. 10 and 11. I also show an idle roll as 26, mounted upon the king bolt 13 to which rolls A and B, are pivoted. By means of this idle roll and the guides 23 and 24, it is possible to resaw very thin material without any liability of its swinging from the line of the cut before it leaves the saw. I have also shown in Figs. 8 to 10, the shafts or rolls B and D, produced to receive supplemental rolls 27, as indicated in Fig. 2, and so provide for sawing extra widths of lumber. The springs 18, have set screws 28, placed behind them to regulate the tension thereof.

In regulating the vertical position of the rolls the slides 10 and 11, are raised or lowered at their ends by means of set screws 29, bearing against blocks 30, located in the guides for said slides as seen in Fig. 6. When the slides and the rollers have thus been brought into the proper position, Babbitt metal may be poured into the sockets or guides for said slides as indicated at 31.

To the ends of the slides are secured projections 32, for the reception of adjusting screws 33, 34. These screws pass through trunnion nuts secured at the under side of the lever 35, by trunnion 35', which are pivoted in said lever; the latter being in turn pivoted at 36, to the tilting frame. The outer end of this lever is engaged by the upward projection of the weighted elbow lever 37, which is pivoted at 38 to a stud projecting from the tilting frame through a slot in the main frame. By means of the screws 33 and 34 the relative locations of the feeding rollers with respect to the line of cut are determined. By means of the weighted lever 37, the rolls are then kept to the inner extreme of said adjustment but are allowed to be forced back by variations of the lumber being resawed.

The arrangement of the levers, trunnion nuts and screws provides for the self-centering of the feeding rolls. To limit the self-adjustment of the rollers A, B, to a certain distance

from the line of cut, a stop 39, is provided upon the tilting frame against which the lever 35, may rest. By this construction if, for instance, the machine is set for resawing two inch stuff and a piece more than two inches thick is presented, the rolls will automatically center the board upon the line of cut and two boards of equal thickness will be produced. If, however, the rolls A and B, have been adjusted so that they can approach within but an inch of the line of cut, which adjustment is regulated by the screw connected to the slide 11, and a board less than two inches thick be presented, the rollers C and D, will spring inward against the board and keep it against rollers A and B, but not with sufficient force to cause them to recede from the line of cut. In this way one perfect board will be produced which is a great saving over the former mode of operation in which the rolls would have self-centered on the thin board the same as on the thick board and produced two thin pieces.

Obviously one of the set of rolls C, D, say C, and one of the set A, B, say A, may be omitted and still the same action as to self-centering would take place, but I prefer to use two rolls in each set as specified inasmuch as the lumber is more evenly guided thereby.

In resawing it is essential that the upper saw guide be kept as close to the lumber as possible. This necessitates frequent adjustment of said guide and to provide for said frequent adjustment I provide a counter-balanced T lever 40, pivoted at some point above the machine, one arm of said T, being connected to the saw guide by the rod 41, and the other bearing the counterbalancing weight 42. To the stem of the T I connect the horizontal rod 43, which slides through the stop bar 44. The upper edge of this rod is fluted where it passes through said stop bar, and said fluted edge is retained in engagement with the edge of the slot in said stop bar by means of the spring 45, seated on the lower edge of said slot and bearing against the under side of the fluted bar. With this device to change the position of the upper saw guide it is only necessary to reach up and pull the bar 43, slightly downward and thrust it in the proper direction to elevate or depress the guide.

If it is desired to tilt the feeding rolls so as to saw clap boards or to saw lumber at an angle for any other purpose it is only necessary to loosen the set screw 46 which is connected to an arm extending from the tilting frame and engages with a slotted piece 47, projecting from the frame of the machine and rotate the screw 48, the set screw being again tightened when the rolls have assumed the desired angle, the tilting frame for this purpose being constructed and mounted substantially as shown and substantially as set forth in my Patent No. 503,768, above referred to.

To provide for the adjustment of the upper band wheel to accommodate saws of different

lengths, I mount the cross head 49, to slide vertically on suitable guides formed on the column 2. To the face of this cross head I secure guides through which passes the slide 50. This slide is supported by means of a screw 51, turning into its lower end and having its support upon the frame of the machine. This screw I rotate by means of a worm a and a pinion b operated by the wheel 52. Upon the upper end of the slide 50, is fulcrumed the lever 53, which bears by its short arm against a ledge projecting from the cross head and carries on its longer arm the weights 54. It will be seen that by this construction the cross head may be raised or lowered, as desired, by means of the screw and that the said cross head may have a slight vertical movement provided by means of the weighted lever to allow for heavy strains upon the saw. This mode of compensating for heavy strains which may be brought to bear upon the saw does not provide for short and sudden strains to which the saw is sometimes subjected. A more sensitive tension device must be provided to compensate for these short and sudden strains. My construction for this sensitive compensation consists in hinging to the cross head a beam or web 55, in which the axle for the upper band wheel is journaled and in providing a plate spring 56, between the said beam and cross head. Said beam being hinged at one side to the cross-head and spring 56, being located between said parts, said spring will force the beam upwardly about the hinge pintles as a center when it has been depressed by sudden strain upon the saw. In this compensating adjustment of the beam and the wheel carried thereby, the hinges serve to guide the beam so as to always preserve the angle of the axis to the plane of rotation of the saw. The hinge for said beam which is next to the band wheel has its leaf y pivoted to an upward projection z from the cross head by means of the bolt 57, so as to allow for a vertical movement of the opposite end of the beam in the vertical adjustment of the upper band wheel. This vertical adjustment is provided for by extending the leaf 58, of the outer hinge downward along the side of the cross head and supporting it upon a hand screw 59, located in a horizontal lug upon said cross head, a set screw having a hand wheel 60, being provided for maintaining the leaf of said hinge in an adjusted position. By loosening the set screw and operating the screw 59, the outer end of the beam and, therefore, of the shaft of the upper band wheel may be raised or lowered, as desired, to give the necessary vertical adjustment to the upper band wheel. It is also necessary to provide a suitable cross-lining device for the shaft of the upper band wheel. This I do as shown in detail in Fig. 7, by constructing the cam k upon the pintle 61, of the outer hinge. For the purpose of operating this cam I attach to the end of said pintle a bar 62, which shall be held in any adjusted position by

means of the notched spring 63, secured to the cross head.

As will appear from Figs. 1, 4 and 7, a movement of the bar 62, to the right will rotate the cam $\frac{1}{2}$, to the left and draw the end of the beam to which it is attached to the left and if bar 62, be moved in the reverse direction that end of the beam will be moved to the right. This movement, though slight, is sufficient to swing the upper band wheel about a vertical line through its center and produce the desired change in position of the saw upon said wheel which is the object of cross-lining. Usually there is sufficient lost motion about the hinge next to said wheel to allow for the above described operation but to absolutely insure this result the bore in lugs, may be belled at both ends as indicated in dotted lines in Fig. 4.

What I claim as my invention is—

1. In a sawing machine, the combination with the bed of the machine, of slides for carrying the feeding rolls extending across the line of cut from side to side of said bed, as and for the purpose set forth.

2. In a sawing machine, the combination with the bed of the machine having bearings or guides formed therein at the sides, of slides extending from side to side of the machine and fitted to said guides, feeding rollers mounted respectively upon said slides at either side of the line of cut, and means for adjusting the slides, as and for the purpose set forth.

3. In a re-sawing machine, the combination with slides and feeding rollers mounted thereon, of self-centering or equalizing mechanism therefor tending to advance said rollers toward the line of cut, a stop by which the roller or set of rollers at one side of said line may be halted at a predetermined distance from the line of cut and means for continuing the advance of the opposing roller or set of rollers.

4. In a sawing machine, the combination, with the slides extending across the machine, of feeding rolls carried thereby and arranged parallel with the line of cut and one or more of said rollers mounted independently of the others on a bearing having means for forcing it toward the line of cut, and means connected to said slides for automatically pressing the rollers toward the line of cut.

5. In a resawing machine, the combination with the slides and self-centering mechanism for the feeding rolls, of one pair of feeding rolls mounted in fixed parallelism with the line of cut, a stop for limiting the self-centering movement of said rolls, and the other pair of feeding rolls each of which is mounted independently of the other in a spring-pressed swinging frame, as and for the purpose specified.

6. The combination with the slides for the feeding rolls each provided with a vertical projection having lateral arms, of king bolts or rods passing through lugs on said projections,

a frame pivoted upon one of said rods, set screws passing through the lateral arms for adjusting said frame, two frames pivoted upon the other one of said rods and each carrying a feeding roll, and springs and set screws for each of said two frames for the purpose set forth.

7. In a set of feeding rolls for a resawing machine, a feeding roll consisting of several independent sections each mounted in a spring pressed frame, and means for uniting said frames to cause the several sections to move together as one roll, substantially as set forth.

8. In a resawing machine, the combination with the slides extending across the bed of the machine and protruding at one side thereof and the feeding rolls carried thereby, of the adjusting screws connected to the protruding ends of the slides, the adjusting lever connected to said screws and to the frame of the machine, the stop for limiting the motion of said lever, and a weighted lever pivoted to the frame of the machine and engaging with the adjusting lever, as and for the purpose specified.

9. In a band sawing machine, the combination with the column for the upper band-wheel, of a cross-head carrying said wheel and mounted to slide vertically on said column, and a vertical slide fitted in ways on said cross-head, a screw supported on the frame of the machine and operating to raise or lower said slide, a weighted lever fulcrumed on said slide and engaging with said cross-head for retaining the latter in an elevated position, substantially as set forth.

10. In a band sawing machine, the combination with the frame of the machine, of a cross-head mounted thereon, automatic adjusting mechanism interposed between the frame and cross-head to compensate for heavy strains upon the same, an adjustable beam carrying the bearings for the upper band wheel and guided so as to preserve in its movement the angle of the axis of the wheel to the plane of rotation of the saw, and a spring interposed between it and the cross-head to compensate for slight and sudden strains upon the same.

11. The combination of the band saw wheel, bearings therefor carried by a swinging beam or support swinging on an axis parallel to the axis of the wheel, a spring acting on said support to compensate for sudden strains, and a movable cross-head or support carrying said beam, and automatically adjustable to compensate for heavy strains.

12. In a band sawing machine, the combination with the cross-head, of a web or beam carrying the journal boxes for the shaft of the upper band wheel, a hinge for the end of said beam next to the saw pivotally mounted upon the cross-head, a hinge for the opposite end of said beam mounted to slide in vertical adjustment on said cross head, and a spring located between the beam and the cross-head, substantially as and for the purpose set forth.

13. The combination with the cross-head, of the beam or web carrying the shaft for the upper band wheel, a spring interposed between said beam and cross-head, a pivotal hinge for the end of said beam next to the band wheel, a hinge for the opposite end of said beam provided with a cam pintle, and means for rotating said pintle for cross-lining said shaft, as set forth.

14. The combination with the vertically adjustable upper saw-guide, of the pivoted T lever, one arm of which is connected to said guide, a counterbalancing weight connected to the other arm, an operating rod connected to the stem of the T lever, and means for automatically fixing said rod in various positions of adjustment.

15. In a resawing machine, the combination with the slides, of a set of feeding rolls fixed upon one slide, an opposing set of feeding rolls mounted upon the other slide and spring-pressed toward said first mentioned rolls, means for adjusting said slides and their feeding rolls relatively to each other and to the line of cut, self-centering mechanism for said rolls, and means for limiting the action of the self-centering mechanism at a predetermined point without preventing the advance of the spring-pressed rolls.

16. In a band resaw, the combination with a slide of a swinging frame mounted thereon

and carrying a feeding roll, spring plates secured to said frame, and a pressure plate mounted upon the free ends of said spring plates at the side of the saw.

17. In a band resaw, the combination with a set of feeding rolls, at one side of the line of cut, a guiding plate rigidly mounted upon the frame of said rolls and located abreast of the saw and extending beyond the edges thereof, a set of feeding rolls at the opposite side of the line of cut, a swinging frame in which said rollers are mounted, a slide carrying said frame a pressure plate located abreast of the saw, and spring plates connecting it to the frame of said second set of rolls.

18. The combination with the beam or web carrying the shaft of the upper band wheel, of supporting means therefor which cause it to move in parallelism to its normal position in compensating for sudden strains upon the saw, a spring for returning said web to its normal position, and means for adjusting said web for equalizing the tension upon all parts of the saw blade.

Signed at Saginaw, in the county of Saginaw and State of Michigan, this 5th day of May, A. D. 1894.

EDWARD C. MERSHON.

Witnesses:

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W. B. MERSHON.