

No. 644,125.

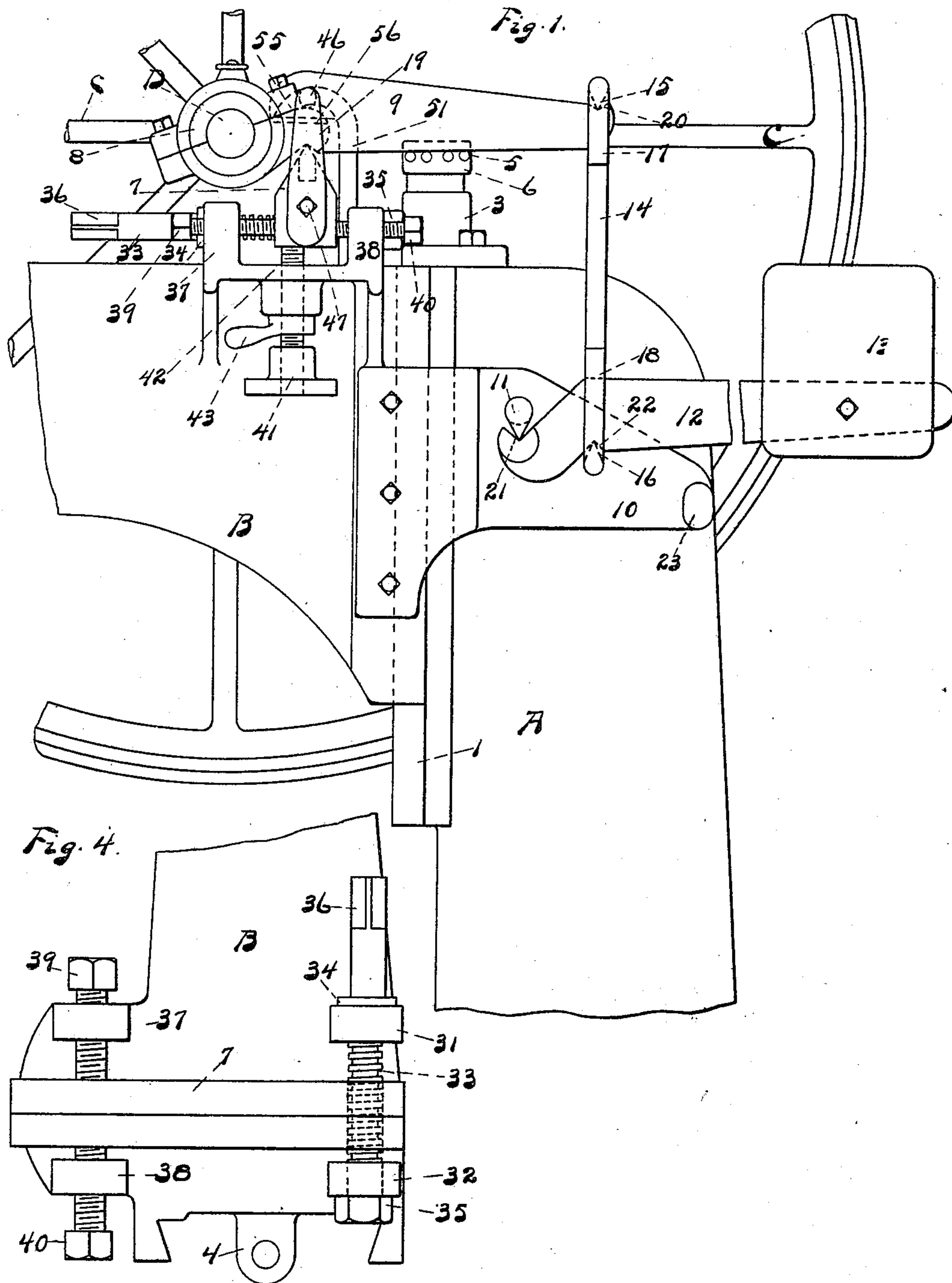
Patented Feb. 27, 1900.

G. W. BUGBEE.
BAND SAWING MACHINE.

(Application filed Aug. 12, 1899.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses:
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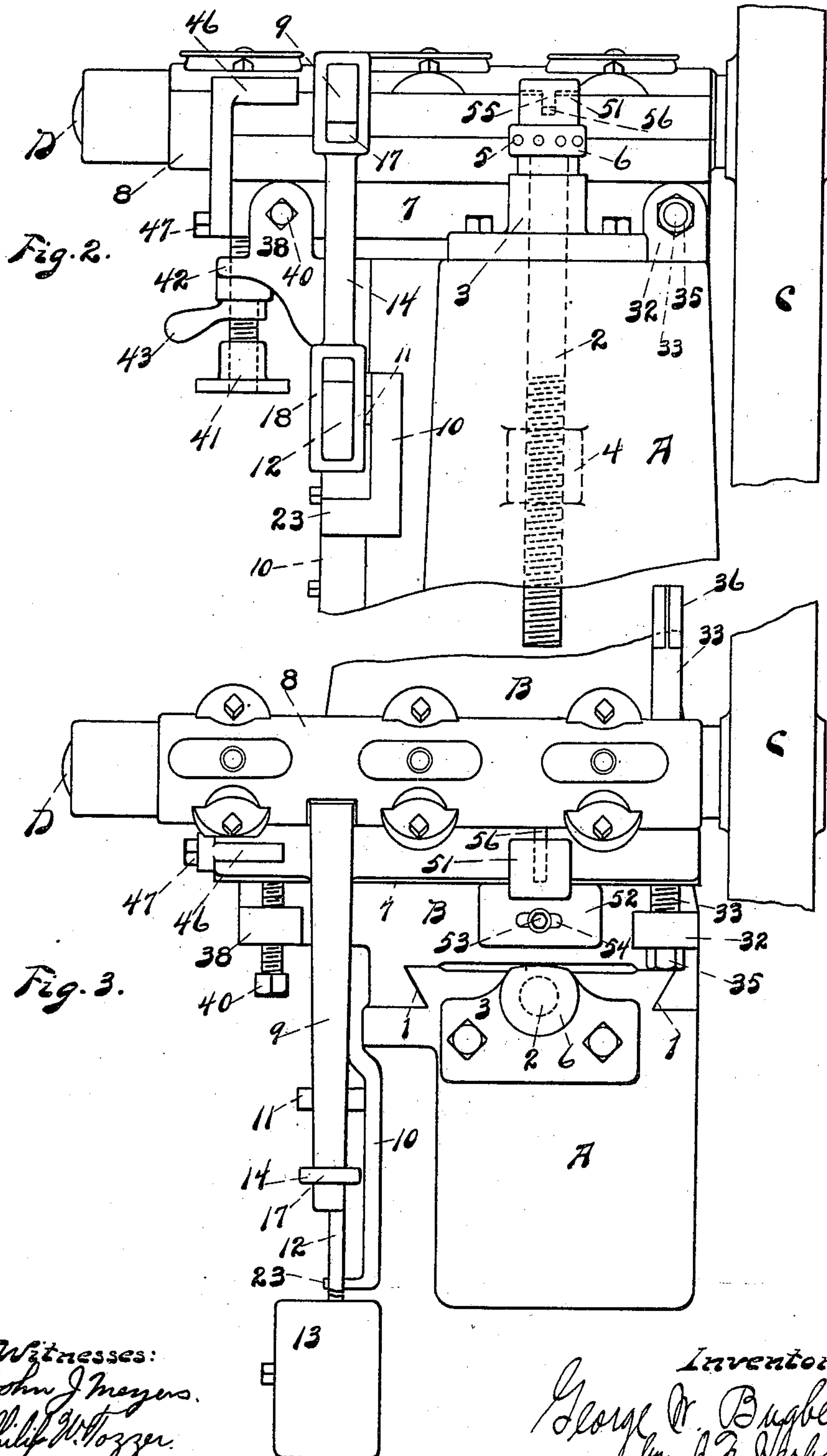
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UNITED STATES PATENT OFFICE

GEORGE W. BUGBEE, OF DELHI, OHIO, ASSIGNOR TO THE J. A. FAY & EGAN COMPANY, OF CINCINNATI, OHIO.

BAND SAWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 644,125, dated February 27, 1900.

Original application filed May 1, 1899, Serial No. 715,164. Divided and this application filed August 12, 1899. Serial No. 727,054. (No model.)

To all whom it may concern:

Be it known that I, GEORGE W. BUGBEE, a citizen of the United States, residing at Delhi, in the county of Hamilton and State of Ohio, have invented a certain new and useful Improvement in Band Sawing-Machines, of which the following is a specification.

My invention relates to certain new and useful improvements in band sawing-machines.

10 It consists in mounting the upper or supporting band-saw wheel of a machine of this character on a knife-edge in such a manner that the tension on the saw-blade is always maintained and inequalities in strain on the blade exactly and instantly compensated for.

15 It consists, further, in mounting the upper or supporting band-saw wheel in a lever resting solely on a knife-edge bearing, in connecting the lever with a pressure device solely through knife-edge bearings, and providing a device capable while acting through the same parts or agencies of compensating for the great and sudden strains to which a band-saw blade is subjected—as, for instance, when the board strikes the blade or when the blade passes through hard and knotty substances or when boards of very uneven thicknesses are fed into the machine—as well as for the slight but ever changing variations in the strain on the blade, due, for instance, to the expansion and contraction of the saw-blade, retaining the blade at a uniform tension and acting as sensitively as a knife-edge balance-scale in compensating for the strain on the blade, whether great or slight, through the same agencies and one in which the largest as well as the smallest band-saw blades can be used without danger of being broken.

20 It consists, further, in providing a device in which the variations in strain on the band-saw blade are compensated for on the instant by a single bearing-support for the upper saw-wheel shaft supported solely by a knife-edge and in which all the variations in the strain on the blades are directed to a single rocking compensating support mounted on a knife-edge adjacent to the upper band-saw-wheel shaft, and, further, in mounting such upper saw-wheel-bearing support to one side of the upper saw-wheel, thereby producing com-

25 pactness in construction and minimizing the objections resulting from strain of metal, lost motion, and torsion of parts.

It consists, further, in the parts and in the construction, arrangement, and combinations of parts hereinafter more fully described and claimed.

I have made application for Letters Patent, filed under date of May 1, 1899, being Serial No. 715,164, for band sawing-machines, showing and describing the subject-matter embraced in this application; but I do not claim the same therein, and the present application is a divisional application of the one so previously filed, and reference is hereby respectively made to the same.

In the drawings, Figure 1 is a side elevation of so much of a band sawing-machine as will illustrate my invention. Fig. 2 is a rear elevation of the same with the weight removed. Fig. 3 is a plan view of the same, and Fig. 4 is a plan view of the knife-edge bar for the upper saw-wheel and its side adjustments.

A represents the column or frame of the machine, on which a bracket B is adjustable on ways 1 by means of a screw-shaft 2, supported in a bearing 3 on the column and engaging an internally-threaded lug or nut 4 on the bracket. The screw-shaft is turned in any suitable manner, as by means of a wrench insertible in eyelets 5 in a collar 6 on the screw-shaft. The bracket supports a knife-edge bar 7 in the manner hereinafter explained.

An upper band-saw-blade-supporting wheel C is secured to an axle D, journaled in a bearing or bearings 8 on a lever 9, fulcrumed on the knife-edge bar 7, extending parallel to the axis of the wheel. The upper saw-wheel C is adapted to support a band-saw blade taking over the same and driven from a second band-saw wheel in the lower part of the frame in the ordinary manner.

The bracket B rigidly supports a plate 10, extending rearwardly therefrom, on which is an inverted knife-edge lug 11, acting as a fulcrum for a weight-lever 12, to which is secured a weight 13. The saw-wheel-shaft-supporting lever and the weight-lever are

connected by means of a link 14, connecting with the former by a knife-edge bearing 15 and the latter by a knife-edge bearing 16. The knife-edge bearings 15 and 16 are preferably located in loops 17 and 18 in the link. The knife-edge bearings 7, 15, 11, and 16 preferably contact, respectively, with suitable contact depressions 19, 20, 21, and 22, the first two on the saw-wheel-supporting lever, the latter on the weight-lever. The plate 10 also carries a lug 23, on which the weight-lever may rest when removing or replacing saw blades on the wheels. It acts as a stop for the weight-lever.

In order to adjust the upper band-saw wheel relatively to a vertical plane and also cross-line the same to determine the track of the band-saw blade, I provide adjustments for the knife-edge bar on which the saw-wheel lever is supported. The bracket B is provided with lugs 31 32, in which a screw-shaft 33 is journaled and held against endwise movement by collars 34 35. The screw-shaft has a squared end 36 or other arrangement to receive a key or wrench for turning the same. The screw-shaft 33 takes through an internally-threaded aperture in the knife-edge bar 7, and by turning the former the latter is adjusted sidewise at one end. The bar 7 is also hung pivotally on the shaft 33 at that end. The bracket B also has lugs 37 38, internally threaded to receive bolts 39 40, adapted to take against the respective sides of the knife-edge bar 7 and adjust it sidewise at its other end. A vertical adjustment is given to it at the same end by means of an adjusting-screw 41, taking through an internally-threaded lug 42 on the bracket and contacting with the bar. A jam-nut 43 secures the adjusting-screw in place. The adjusting-screw 41 gives to the bar a delicate vertical angling adjustment for alinement of the saw-wheel shaft and the screw-shaft, and set-bolts give it a delicate sidewise adjustment. These various adjustments are imparted to the saw-wheel axle and wheel and give the blade its proper track and adjust the wheel to proper relation with the blade. A swiveling adjustment is thus given the upper band-saw wheel in all directions by simple and effective means, the adjustment of the bar being imparted to the wheel without change of the relative position of the wheel to the bearing for its shaft and the bar, those parts maintaining the same relative position throughout and allowing a swiveling adjustment to be given the saw-wheel while the machine is in operation by the adjustment of a single part. I also mount the saw-wheel-supporting shaft with its alining, straining, and balancing mechanism on an adjustable bracket, adjustable on the column of the machine to adjust the parts to proper position relative to length of saw-blade without disturbing any of the adjustments of the saw-wheel axle for track or alinement of the blade previously made.

In my improved construction tension is ex-

erted on the blade by the weight or other pressure of the pressure-lever through the lever against the knife-edge of its fulcrum, the knife-edges of its connecting-link with the saw-wheel lever, and the knife-edge of the bar on which the latter lever is fulcrumed to the saw-wheel proper, and provides an effective, delicate, and quickly-acting balance for the saw-wheel which will readily accommodate itself to the delicate and everchanging conditions arising in the operation of a rapidly-moving band-saw blade about the wheels, the changing conditions of the cut and temperature of the blade, and insuring a quickly-acting adjusting medium to keep the saw at proper and uniform tension throughout the changing conditions mentioned. In my improved construction also the upper saw-wheel shaft is mounted solely in a rocking bearing supported solely on a knife-edge to one side of the band-saw wheel, from which latter all variations in the band-saw blade are communicated on the instant and directly to the knife-edge support.

The band-saw-wheel axle is preferably journaled directly in the end of the lever with its knife-edge fulcrum adjacent thereto, but out of vertical line therewith, on which latter the lever is solely fulcrumed. The other end of the lever connects directly with a knife-edge bearing on the link connecting directly to the weight-lever, also through a knife-edge bearing, and the weight-lever is fulcrumed directly on a knife-edge lug on the bracket, making an intimate connection from the weight to the upper saw-wheel shaft bearing solely through knife-edge bearings, the upper saw-wheel-shaft lever itself being also supported solely on a knife-edge, making a construction as delicately, directly, and positively acting as a knife-edge balance-scale in its compensations for slight as well as great variations in the strain on the saw-blade. It has been a desideratum in band sawing-machines to provide a device whereby the slight variations in the strain on the blade, due, for instance, to the expansion and contraction of the saw-blade, owing to its heating and cooling in the sawing operation, and a device whereby the great and sudden strains on the band-saw blade, due, for instance, to the striking of the blade by the board or when the board strikes hard knotty substances or when boards of very uneven thicknesses are fed to the machine, may be compensated for. In my improved device I accomplish both objects by the same mechanism, and I also provide a device which is exceedingly delicate and sensitive in its response to any strain whether light or great, sudden or gradual, on the saw-blade, compensating for any strain whatever on the instant. In my improved device also all the parts are strong and substantial, the friction which would tend to hinder an instant response to the strain is avoided, there are no sliding parts to produce friction and retard instant action and compensa-

tion for any difference in strain on the blade, the parts are compact and economical in operation, and the cost of construction is minimized.

5 A finger 46, attached to the bar 7, as by means of a bolt 47, takes over the saw-wheel-carrying lever substantially vertically above the contact-point of the bar therewith, and serves to retain the lever on its knife-edge
10 fulcrum in case of jar caused by the accidental breaking of the band-saw blade or other causes. A second finger 51 extends from a plate 52, adjustably secured to the bracket, as by means of a bolt 53, taking
15 through a slot 54 in the plate into the bracket. The finger projects over the bearing for the upper saw-wheel and has a rib 55 on the under side of the projection taking into a groove 56 in the bearing to prevent longitudinal displacement thereof and of the saw-wheel
20 axle D.

It is obvious that changes may be made in the construction I have preferred to show without departing from the spirit of my in-
25 vention.

I claim—

1. In a band sawing-machine, the combination of an upper saw-wheel, with a shaft therefor journaled in a single lever supported solely
30 on a knife-edge extending lengthwise of the saw-wheel shaft, substantially as described.

2. In a band sawing-machine, the combination of an upper saw-wheel, a shaft therefor, with a single bearing-support for the shaft
35 supported rockingly solely on a knife-edge extending lengthwise of the shaft, substantially as described.

3. In a band sawing-machine, the combination of an upper overhanging saw-wheel, with
40 a shaft therefor journaled in a single lever supported solely on a knife-edge extending lengthwise of the saw-wheel shaft, substantially as described.

4. In a band sawing-machine, the combination of an upper saw-wheel, a shaft therefor, with a single bearing-support for the shaft to
45 one side of the saw-wheel supported rockingly solely on a knife-edge extending lengthwise of the shaft, substantially as described.

5. In a band sawing-machine, the combination of an upper saw-wheel, a shaft therefor, with a single bearing-support for the shaft to
50 one side of the saw-wheel supported rockingly solely on a knife-edge extending lengthwise of the shaft and adjacent to the vertical plane of the shaft, substantially as described.

6. In a band sawing-machine, the combination of an upper saw-wheel, a shaft therefor, a lower saw-wheel, and a band-saw blade for
60 taking about the wheels, with a single bearing-support for the shaft of the upper saw-wheel supported rockingly on a knife-edge extending lengthwise of the shaft, and constructed and arranged for compensating for the variations in strain on the band-saw blade
65 on the instant in parallel lines from a single rocking support direct to a single rigidly-con-

nected line of knife-edge contact, substantially as described.

7. In a band sawing-machine, the combination of an upper saw-wheel, with a supporting rocking bearing therefor, supported rockingly solely on a knife-edge extending lengthwise of the bearing, with an angling vertical adjustment for the knife-edge, substantially
75 as described.

8. In a band sawing-machine, the combination of a saw-wheel shaft, a rocking bearing therefor, a knife-edge bar solely supporting the bearing, with a weighting device, and a
80 stop to limit the rocking movement of the bearing, substantially as described.

9. In a band sawing-machine, the combination of a saw-wheel shaft, a rocking bearing therefor, a knife-edge bar solely supporting
85 the bearing, with a weighting device, and a stop to limit the longitudinal movement of the shaft, substantially as described.

10. In a band sawing-machine, the combination of a saw-wheel shaft, a rocking bearing therefor, a knife-edge bar solely supporting the bearing, with a weighting device, a
90 stop for limiting the rocking movement of the bearing, and a stop for limiting the longitudinal movement of the shaft, substantially
95 as described.

11. In a band sawing-machine, the combination of a saw-wheel shaft, a rocking bearing therefor, a knife-edge bar for supporting the bearing, a pivotal support for the bar,
100 and a set-screw or similar means for adjusting the bar on its pivot, substantially as described.

12. In a band sawing-machine, the combination of a saw-wheel shaft, a rocking bearing therefor, a knife-edge bar for the bearing, a pivotal support for the bar, a set-screw
105 or similar means for adjusting the bar on its pivot, and a transverse adjustment or adjustments for the bar, substantially as described.

13. In a band sawing-machine, the combination of an upper saw-wheel lever, having a bearing for the upper saw-wheel shaft at one end rigid with relation thereto and supporting the shaft, an upper saw-wheel shaft,
110 a knife-edge bearing for the lever adjacent to the shaft but out of vertical line with its axis and extending lengthwise of the shaft, a weighting device connecting with the other end of the lever, and an angling vertical adjustment for the knife-edge bearing for the
115 saw-wheel lever, substantially as described.

14. In a band sawing-machine, the combination of an upper saw-wheel lever having a bearing for the upper saw-wheel shaft at one
125 end rigid with relation thereto, a knife-edge bearing for the lever adjacent to the shaft but out of vertical line with its axis, and a weighting device connecting with the other end of the lever through a knife-edge bearing, and
130 a swiveling adjustment for the knife-edge bearing for the saw-wheel lever, substantially as described.

15. In a band sawing-machine, the combi-

nation of a single upper saw-wheel lever, having a bearing for the upper saw-wheel shaft thereon rigid with relation thereto and supporting the shaft, an upper saw-wheel shaft, 5 a knife-edge fulcrum for the lever, extending longitudinally of the shaft, an angling vertical adjustment for the knife-edge fulcrum, a pressure-lever, a knife-edge fulcrum for the same, a link having knife-edge connections with the saw-wheel lever and the 10 pressure-lever, with a pressure device, substantially as described.

16. In a band sawing-machine, the combination of a frame, a band-saw-wheel lever, a 15 band-saw wheel mounted therein at one end, a knife-edge bar located intermediate of its ends and serving as a fulcrum therefor, an adjusting-screw on which the bar is pivotally hung to give it sidewise adjustment at one 20 end, a set-bolt at the other end for vertical adjustment, a set bolt or bolts at the same end for horizontal adjustment, a pressure-lever, a knife-edge fulcrum for the same, a link having knife-edge connections with the saw- 25 wheel lever and the pressure-lever, with a pressure device, substantially as described.

17. In a band sawing-machine, the combination of a saw-wheel lever, a saw-wheel shaft mounted therein, a knife-edge fulcrum for 30 the same, an angling horizontal and an an-

gling vertical adjustment therefor, a pressure-lever, a knife-edge fulcrum for the latter, a link having knife-edge connections with the levers, and a stop to limit the movement of the saw-wheel lever, substantially as described. 35

18. In a band sawing-machine, the combination of a main frame, with a bracket adjustable thereon supporting a knife-edge fulcrum for an upper saw-wheel shaft, an angling vertical and an angling horizontal adjustment therefor, a saw-wheel lever pivoted on the knife-edge fulcrum, a bearing for the saw-wheel at one end thereof, a knife-edge fulcrum, a weight-lever contacting therewith, 45 a link with a knife-edge at each end contacting with the saw-wheel lever and the weight-lever, and a stop for the weight-lever, with a screw-shaft for adjusting the bracket and parts supported thereby with relation to the 50 frame, constructed and arranged substantially as described.

In testimony whereof I have signed my name hereto in the presence of two subscribing witnesses.

GEORGE W. BUGBEE.

Witnesses:

PARKE S. JOHNSON,
JOHN J. MEYERS.