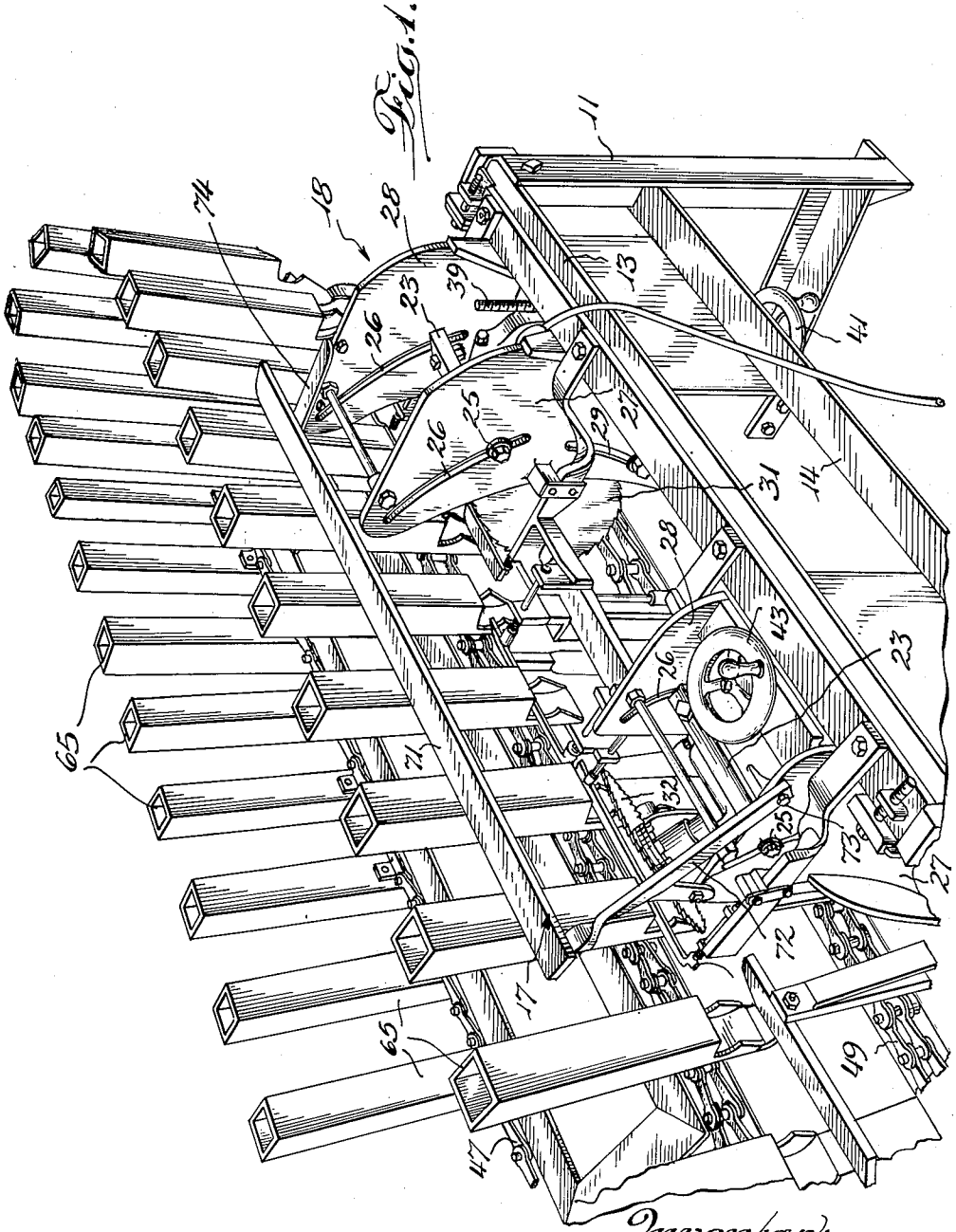
April 14, 1953 E. J. STAUFFER 2,634,769

DOUBLE ANGULAR CUT GLUE BLOCK PRODUCING MACHINE

Filed Feb. 14, 1948 4 Sheets-Sheet 1

Fig. 1.



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DOUBLE ANGULAR CUT GLUE BLOCK PRODUCING MACHINE

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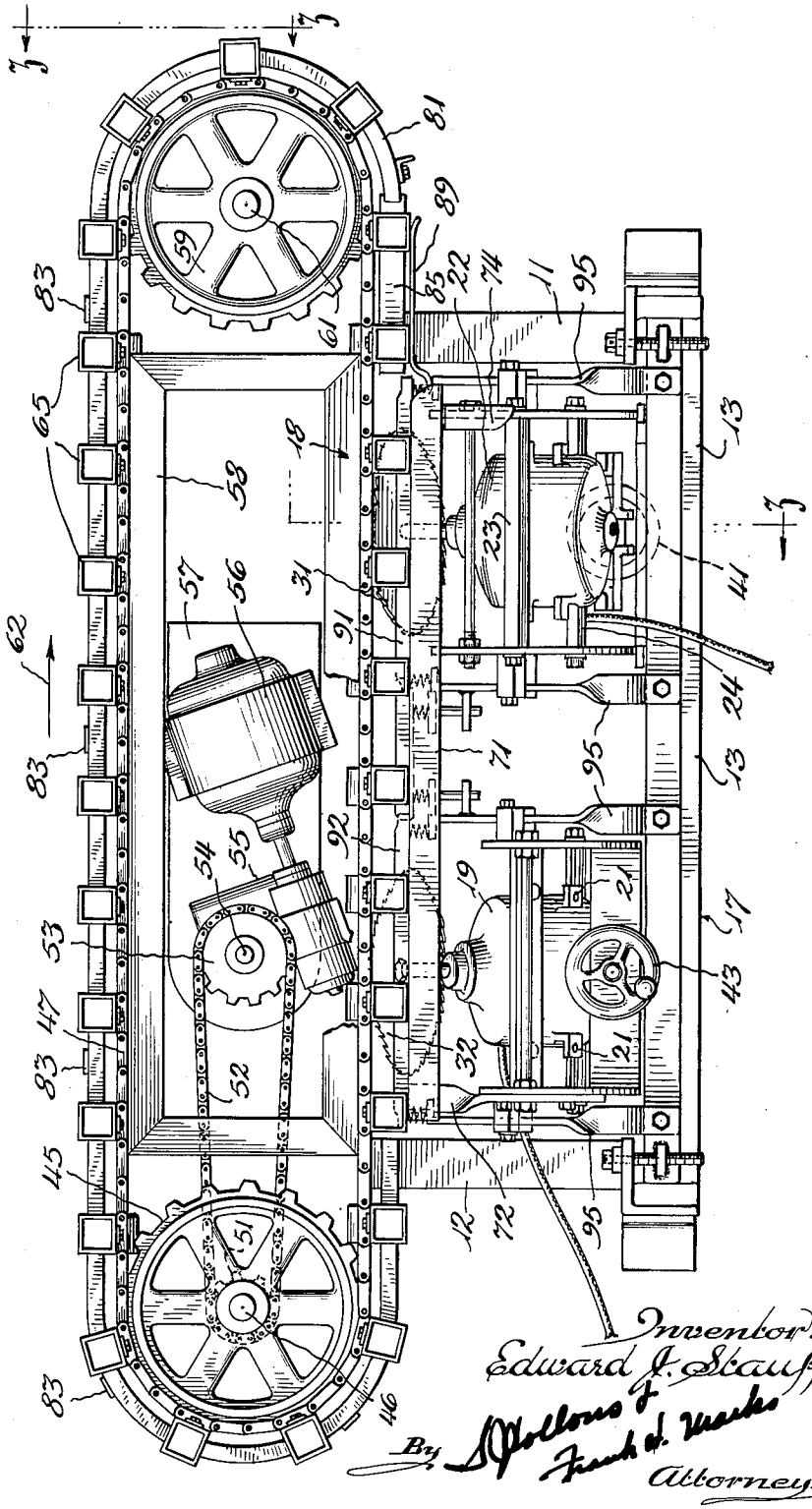


Fig. 2.

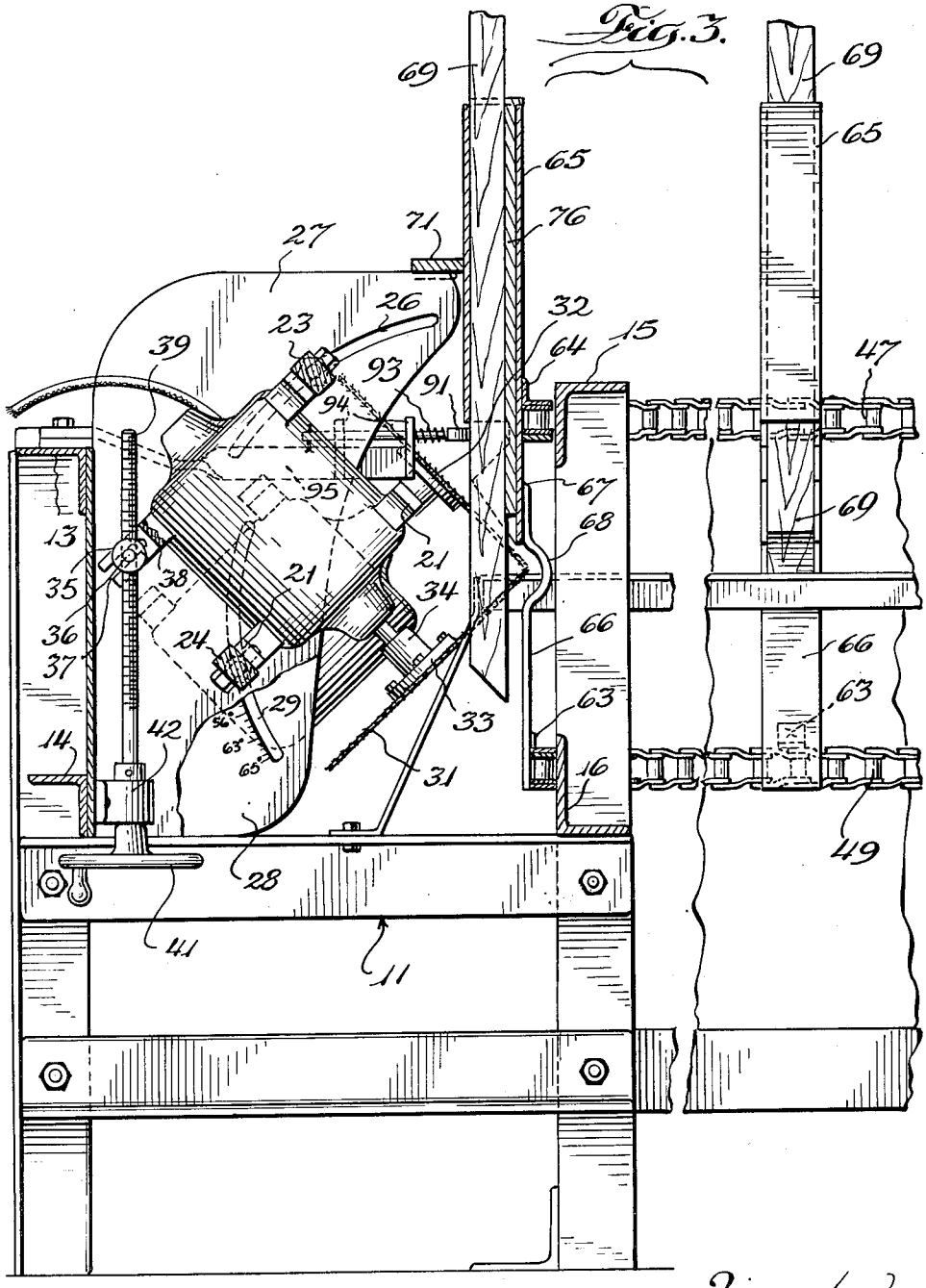
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DOUBLE ANGULAR CUT GLUE BLOCK PRODUCING MACHINE

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Fig. 3.



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DOUBLE ANGULAR CUT GLUE BLOCK PRODUCING MACHINE

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Fig. 4.

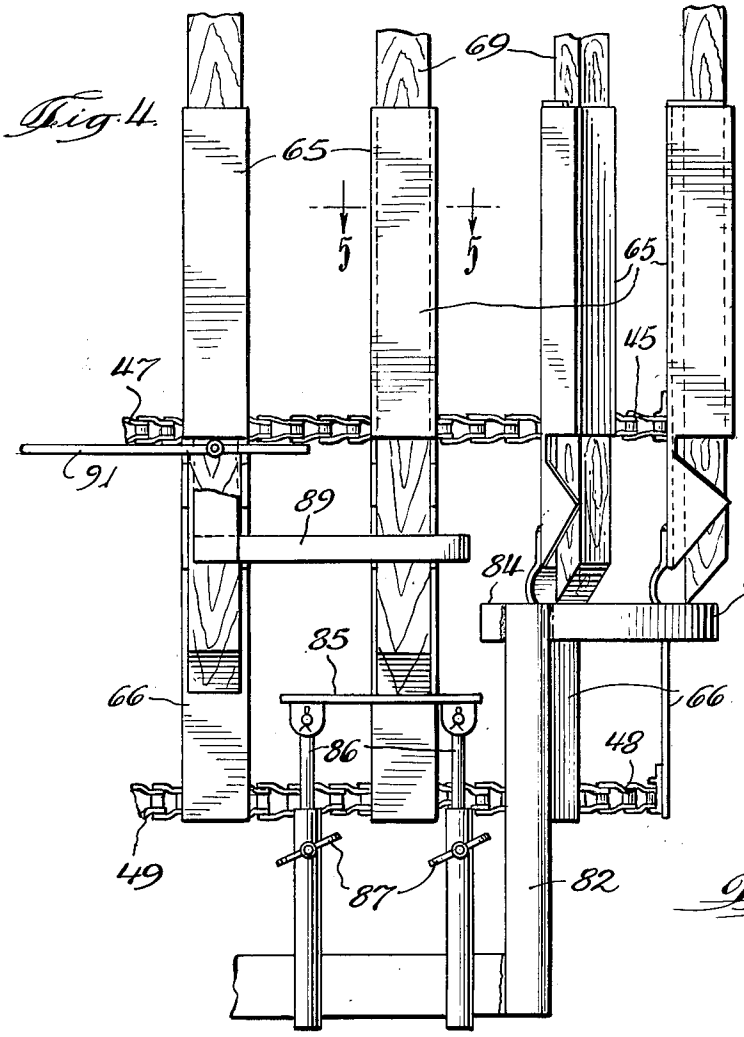
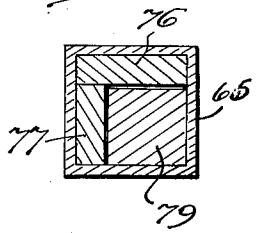


Fig. 5.



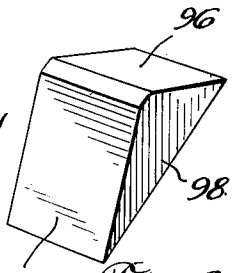


Fig. 6.

Fig. 9.

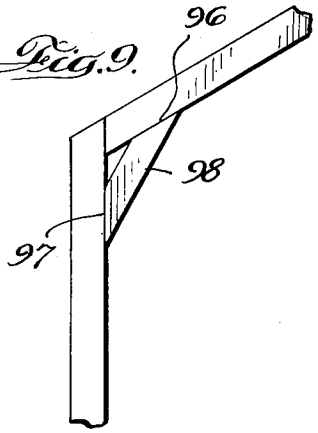
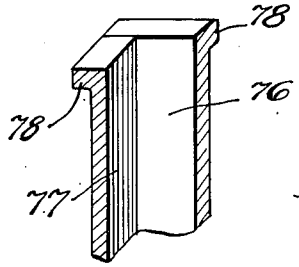


Fig. 7.



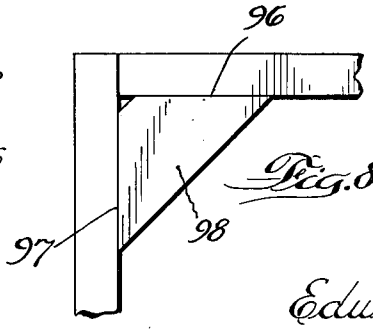


Fig. 8.

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UNITED STATES PATENT OFFICE

2,634,769

DOUBLE ANGULAR CUT GLUE BLOCK PRODUCING MACHINE

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Application February 14, 1948, Serial No. 8,360

1 Claim. (Cl. 143—38)

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The present invention relates to woodworking special machinery and is concerned more particularly with an apparatus which will cut, under continuous production line methods, reinforcement or corner blocks such as are used in securing frame junctions in furniture, cabinet work and similar arts.

Under particular contemplation is the conventional manufacturing method for producing parlor furniture, including upholstered chairs, divans, etc., wherein a wooden underframe which may vary in accordance with changing styles, shapes and sizes constitutes a skeleton supporting structure upon which there is superimposed cushioning material and ornate coverings. In the integration of different sections of such frames, the accepted practice has been to utilize reinforcement glue blocks consisting of angularly cut gusset members which present two plane surfaces to be bonded against adjacent surfaces of frame junction elements. The intervening angle between such planes is not always one of 90° although right angle junctions in furniture framework may be said to constitute prevalence over any other single example, and it is therefore desirable in the production of these glue blocks to be able to arrange for variation in the junction angle to a critical degree of accuracy, so that under production line assembly methods such as are known in larger furniture factories constancy of angular dimensions and reasonably close tolerances may be maintained.

Since the use of these glue blocks in a single furniture framework is customarily numerous and in order to maintain the cost of production at economical efficiency, it is of paramount importance that the manufacture of these construction elements may be carried on at an extremely low cost. This objective is somewhat more difficult to achieve in connection with woodworking machinery for the reason that lumber dimensions must necessarily vary from time to time and from source to source due to the custom of relatively wide variances in dimensional tolerances among lumber producers and processors, but more significantly due to the natural causes, such as shrinkage, warpage, etc., which is an inherent characteristic susceptible but little to control.

Recognizing these conditions and circumstances under which the problem is to be solved, it may therefore be stated that the principal object of the present invention is to produce a glue block cutting machine which will lend itself to a wide range of tolerance in stock supply variations and which will, nevertheless, produce reinforcement gussets for gluing, having accurate critical angles in respect to the planes of their gluing surfaces, and which will lend itself to adjustment for variation with respect to these angles.

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Briefly stated, the invention consists of a continuously driven endless belt in which glue block lumber stock is supported in vertical position in a series of holders which progress through two or more cutting zones in each of which there is disposed an angularly adjustable circular saw blade. The saw blades lie in the path of the advancing belt line so as to effect an angular cutting of the stock carried thereby until the product block is severed from the stock material and permitted to fall into a collection receptacle to be carried away in tote boxes periodically to the assembly line position at which the blocks are installed in the furniture frames.

For a more comprehensive understanding of this invention, reference will now be had to the accompanying drawings and to the following detailed specification wherein like reference characters designate corresponding parts throughout, and wherein,

Fig. 1 is a fragmentary perspective view of a glue block cutting machine featuring two cutting saws and preferred apparatus for adjustment in connection therewith;

Fig. 2 is a plan view of a complete belt feed mechanism powering apparatus and adjustable sawing station mechanism for two positions;

Fig. 3 is an enlarged elevational view taken approximately on line 3—3 of Fig. 2 with portions broken away and featuring the adjustment mechanism for one of the station saws;

Fig. 4 is a fragmentary front elevational view of the portion of the belt conveyor apparatus approaching the first of a series of saws and featuring the construction of the adjustment or gauge mechanism whereby the stock is maintained at various heights in order to regulate the length of each gusset or glue block;

Fig. 5 is an enlarged transverse sectional view taken approximately on line 5—5 of Fig. 4;

Fig. 6 is an enlarged perspective view of an exemplary glue block such as is produced by the machine under disclosure, and such as is used in securing together and reinforcing frame junctions in furniture framework;

Fig. 7 is a detailed perspective view of a conveyor tube liner employed in connection with dimensionally smaller stock during the production of glue block units of lesser than maximum capacity dimensions, and

Figs. 8 and 9 are illustrations of furniture

framework junctions indicating variations of glue blocks or gussets and their application to various furniture junction angles.

In the accompanying drawings, the reference numeral 11, Figs. 1 and 2, designates generally one of the end frames made of angle iron components which may be secured together by bolting or riveting and may be symmetrically similar and opposite to the end frame 12. Together these members support cross beams 13, 14, 15 and 16, also of angle iron construction, and upon which there are supported the circular saw blade assemblies generally designated by the reference numerals 17 and 18, Fig. 1.

Each circular saw mechanism 17 and 18 is provided with an individual electrically driven motor 19 and 22 having in its frame mounting lugs 21 whereby it is secured to a pair of cross beams 23 and 24.

At its ends each cross beam 23 and 24 is drilled and threaded so as to receive a cap screw 25 which passes through an arcuate slot 26 in its related one of a pair of side plates 27 or 28. The side plates 27 and 28 are rigidly supported at different elevations in the framework as best indicated in Fig. 1 wherein the side plates of the saw unit 18 will be observed as disposed at a higher elevation than those of unit 17.

The arcuate slots 26 are of such a length as to correspond with an angle of about 30° at an imaginary center near the cutting zone, and cooperating with such slots 26 are another pair of slots 29 in the side plates 27 and 28 of similar angular length but of shorter radius with respect to the imaginary center of rotation. The guide slots 26 accommodate the supporting beam 23 while the guide slots 29 accommodate the supporting beam 24. In this way the housings of motors 19 and 22 may be secured so as to afford different cutting angles to the circular saw blades 31 and 32.

In order to afford close placement of the saw blade with respect to the conveyor apparatus, each is mounted on the flange 33 of a securable collet 34 carried on its respective motor shaft. When changing the cutting angle by rotating the supporting position of its motor housing, an operator is required but to loosen the cap screws 25 whereupon the supporting beams 23 and 24 are made free to move each in the path afforded by its related arcuate slots 26 or 29. In order to relieve this task and to make it more accurately controllable, each motor unit is further provided with a circular cross beam 35 having trunnion pins 36 at its ends which extend into elongated slots 37 in brackets secured to the motor frame as at 38. Near the center of each beam 35, it is provided with a transverse thread hole through which there is adapted to engage a vertically disposed adjusting shaft 39. The adjusting shaft 39 of motor unit 18 is equipped with a hand wheel 41 at its lower end and is journaled in a bracket 42 swingably anchored to the angle iron member 14, while the corresponding shaft of unit 17 is provided with a hand wheel 43 at its upper end journaled in a similar bracket carried by the angle iron 13.

These structural differences, it will be readily recognized, are provided to accommodate the differences in the positions at which the respective units are disposed in connection with the common feed belt that both are adapted to serve.

Particular attention will now be directed to the conveyor system and the apparatus for gauging the stock during its travel therewith. The reference numeral 45 indicates a power driven feed sprocket journaled on a vertical pivot 46 whose teeth are adapted to mesh with the links of an uppermost conveyor belt chain 47. A similar sprocket wheel 48 meshes with the lower belt 49, Fig. 4, so that the two are driven in unison under impetus of the shaft 46 whose driven pinion 51 is chain coupled through the driving chain 52 with a driving sprocket 53 disposed in a horizontal plane and anchored to a shaft 54 which projects vertically from a gear reduction box 55, Fig. 2.

Gear reduction box 55 is worm driven under the power of an electric motor 56 supported on a platform 57 in the center of the conveyor belt frame 58. The speed obtained through this power reduction system is preferably such as to drive the conveyor belts 47 and 49 at a suitable rate consistent with the ability of the saw blades 31 and 32 in accomplishing their severing operations. Driving sprockets 45 and 48 rotate clockwise as viewed in Fig. 2 thereby imparting a similar rotation to the sprocket wheels 59 carried by the idler shaft 61, as well as to the entire conveyor system indicated by the direction of movement arrow 62. Corresponding links in the two chains 47 and 49 are provided with carrier brackets, Fig. 3, designated 63 and 64. Brackets 64 may be directly secured as by welding to the inner surfaces of the rectangular tubes or sockets 65 contributing thereby a principal mode of support, while the brackets 63 are correspondingly secured to specially shaped extensions 66, Fig. 3, each of which may be welded as at 67 to the lower extremity of its related conveyor socket 65. The extension brackets 66 each are curved as at 68 so as to encircle but not interfere with the imaginary center mentioned above which constitutes the foremost extremity traversed by the peripheries of the saw blades 31 and 32.

Thus, while lumber stock such as has been illustrated 69 carried by the tubes or sockets 65 passes completely within the plane of each saw blade 31 or 32 as it is carried by the conveyor system through the two cutting positions, the elements of the conveyor mechanism itself are thereby assured freedom from interference with the cutting saws.

In order to give further rigidity to the tubular receptacles 65, there is provided an alignment bar 71 carried on one end by a bracket 72 secured as at 73 to the side plate 27 and at the other end by a bracket 74 to the side plate 28 or unit 18. The forward edge of alignment bar 71 is adapted to rest firmly against the front faces of the rectangular receptacles 65 as they pass before the two cutting positions and thereby is provided a mode of damping possible vibrational effects such as would otherwise be transmitted to these elements as a consequence of the sawing operations.

It will be understood that in accordance with the rectangular space of each receptacle 65 there is afforded a maximum capacity to lumber stock, but that when smaller cross-sectional stock is intended to be used, each receptacle 65 is fitted with a two dimensional liner comprised of the elements 76 and 77. See also Figs. 5 and 7. These elements are provided with uppermost lip portions 78 to prevent their displacement or sliding through while filling in the space which is left vacant by lumber 79 of smaller cross-section than that corresponding to full capacity. It will be understood that for any special shapes the elements 76 and 77 can be correspondingly varied in

dimension whereby the apparatus may be made to accommodate a wide variety of stock.

Beneath the conveyor chain 47 and shaped so as to be disposed in alignment with the path traveled by the receptacles 65 is a principal supporting track 81 at the level indicated in Fig. 4 on which previously remaining edge of the stock 69 is adapted to rest. In this way the stock is supported throughout its travel after leaving the final sawing unit 17 and before approaching the initial sawing unit 18. The foremost end of track 81 in the position indicated in Fig. 4 is held by a supporting iron 82, similar supporting members being provided as at 83 about its course. As the stock ceases to be supported at the point 84, it drops a distance until it encounters the adjustable support platform 85 held in accordance with the position in which its legs 86 are regulated and secured by the wing screws 87. As the stock passes beyond the platform 85, it is thereafter held in position successively by the tensioning yieldable member 89 and the spring urged tensioning bars 91 and 92, Figs. 2 and 3. Bars 91 and 92 which are similarly constructed are under tension of a plurality of spring loaded guide rods 93 supported for parallel movement by the brackets 94 in a supporting frame 95 of which there are shown four in Fig. 2. Thus, it will be understood that the lumber stock is gravity supported during its idle travel and is placed under tensional support during its cutting engagement with the several saw stations.

In operation a caretaker will load the receptacles 65 with lengths of lumber stock and start the conveyor into operation. The saws 17 and 18 will be continuously in rotation and adjusted to impart the angular cut to the surfaces 96 and 97 of block 98 in accordance with the particular type of frame junction, having in mind variations such as are illustrated in Figs. 8 and 9. In practice it has been found that the angle of adjustment afforded by the arcuate slots 26 and 29 in the guide plates 27 and 28 being of the order of 30° is ample to accommodate the range of variation required under all conditions. It will be obvious to those skilled in the art, however, that special departures in this regard will require but few variations within the teachings herein disclosed.

While the present invention has been explained

with reference to exemplary disclosures, it will be evident that modification thereof may be made without departing from the essential spirit or scope of this invention. Accordingly, it is not intended to be limited by the particular language of the foregoing description nor by the details illustrated in the accompanying drawings, except as indicated in the hereunto appended claim.

The invention claimed is:

In a lumber stock severing machine, a pair of endless chain conveyor belts moving in a horizontal course about pairs of vertically pivoted sprocket wheels, a plurality of tubular lumber stock holders carried by corresponding links of said endless chain conveyor belts, a pair of power driven circular saws disposed at intersecting planes and at different stations in said conveyor course, means for adjusting the angular positions of each of said power driven saws within a predetermined angular range, said means comprising for each saw a pair of side plates having concentric arcuate slots, saw supporting beams carried by and confined in said slots, screw jacks for raising and lowering said power driven saws through arcuate paths guided by said slots, supporting rails for maintaining lumber stock throughout the major portion of said horizontal course, and spring tensioned retaining bars disposed parallelly to the path of travel of said conveyor for retaining said lumber stock during its travel past said saw stations.

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